

Manila Senior Center
Airport Road
Manila, Arkansas
ACEDP GRANT #790-08840-14



deMx architecture

COMM. NO. 35415

April 2, 2017

ARKANSAS COMMUNITY AND ECONOMIC DEVELOPMENT PROGRAM (ACEDP)

ACEDP BID PACKAGE (For General Contractors)



**Arkansas Economic Development Commission
Grants Division
900 W. Capitol Ave., Suite 400
Little Rock, Arkansas 72201
Telephone (501) 682-1211**

The Economic Development Commission does not discriminate on the basis of Race, Color, National Origin, Sex, Age, Religion or Disability; and provides upon request, reasonable accommodation including auxiliary aids and services necessary to afford an individual with a disability an equal opportunity to participate in all programs and activities.

**Bid Package for ACEDP Funded Projects
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Attachment 1A
Bid Package for ACEDP Funded Projects
Advertisement for Bids

Date: March 01, 2017

Manila, AR / Mississippi County
Manila Senior Center
ACEDP Grant #790-08840-14

Sealed bids from licensed contractors for construction of the Manila Senior Center located in Manila, Arkansas, will be received by:

Mayor Wayne Wagner
City of Manila, Arkansas
214 N. Baltimore Street
Manila, AR 72442

until **2:00pm on April 18, 2017** and then at said location publicly opened and read aloud.

The scope of work consists of the construction of a new 3,740 SF Senior Center for the City of Manila, Arkansas, located on Airport Road.

Spaces include: an office, a covered patio, a community room, an exercise room, kitchen, pantry, storage, restrooms, can wash, janitor, and an electrical room. Work is to include site preparation and grading, pouring of concrete foundations and slab.

The structure consists of wood stud walls, pre-fabricated wood roof trusses with wood decking and standing seam metal roofing.

Exterior finishes include modular clear finished wood siding, pre-finished standing seam metal panels, aluminum storefront. Interior finishes include stained and sealed concrete floors, painted gypsum board walls and ceilings, and millwork.

Instructions to Bidders, ACEDP grant requirements, Bid and Contract Forms, Plans, Specifications, and other contract documents may be examined and full sets may be obtained by General Contractors at a nonreimbursable full cost at Jonesboro Blueprint, 222 S Madison St, Jonesboro, AR phone 870-932-4349 email: mdale@jonesboroblueprint.com.

The owner reserves the right to waive any informalities or to reject any or all bids. Bidders may not withdraw their bids within 30 days after the date of bid opening and must provide bid bonds as required. All bidding processes shall be in accordance with State law.

To request bidding information or obtain further information contact:

deMx architecture
104 N. East Avenue
Fayetteville, AR 72701
479-966-4871
info@demxarch.com

(Grantee's Signatory Agent) _____
(Name of City or County) _____

Attachment 1B
Bid Package for ACEDP Funded Projects
Instruction to Bidders

The following information is specific to prospective bidders of ACEDP-funded construction projects:

1. **Receipt and Opening of Bids**

The **City of Manila, Arkansas** (herein identified as "Owner"), invites bids on the forms attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner at the **Manila City Hall** until **2 o'clock p.m., CST, Tuesday, June 20, 2017**, and then at said office publicly opened and read aloud. The envelopes containing the bids must be sealed, addressed to **Mayor Wayne Wagner City of Manila, Arkansas at 214 Baltimore St, Manila, AR 72442** and designated as **Bid for Manila Senior Center**.

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or scheduled time for bid opening or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within **30 days** after the actual date of bid opening.

2. **Preparation of Bid**

Each bid must be submitted on the prescribed form **and must be accompanied by completed Certification of Bidder Regarding Equal Employment Opportunity and Contractor Section 3 Certification forms**. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form. Identification of subcontractors must be per State law.

3. **Facsimile/Telegraphic Modification**

Any bidder may modify his bid by facsimile/telegraphic communication at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the Owner prior to closing time, and, provided further, the Owner is satisfied that a written confirmation of the facsimile/telegraphic modification over the signature of the bidder was mailed prior to closing time. The communication should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened. If written confirmation is not received within two days after closing time, no consideration will be given to the facsimile/telegraphic modification.

4. **Method of Bidding**

The Owner invites the following bid(s):

5. **Qualifications of Bidder**

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids shall not be accepted.

6. **Bid Security**

Each bid must be accompanied by a certified check from the bidder, or a bid bond prepared on the form of the bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company, licensed in the State of Arkansas, approved by the Owner, in the amount of 5 percent of the bid. Such check or bid bond will be returned to all except the three lowest bidders within three days after the opening of bids, and the remaining checks or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract, or, if no award has been made within 30 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

7. **Liquidated Damages for Failure to Enter into Contract**

The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within 10 days after he has received Notice of Award shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

8. **Time of Completion and Liquidated Damages**

The bidder must agree to commence work on or before a date to be specified in a written Notice to Proceed issued by the Owner and to fully complete the project within Three Hundred Sixty Five (365) consecutive calendar days thereafter. The bidder must agree also to pay as liquidated damages, the sum of **\$100.00** for each consecutive calendar day thereafter.

9. **Conditions of Work**

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so

will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible, the contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

10. **Addenda and Interpretations**

No interpretation of the meaning of the plans, specifications, drawings and other contract documents will be made to any bidder orally. Every request for such interpretation should be in writing addressed to **deMx architecture** at **104 N. East Avenue, Fayetteville, AR 72701** and, to be given consideration, must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instruction will be in the form of written addenda to the contract documents which, if issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

11. **Security for Faithful Performance**

In accordance with the Notice to Proceed, the contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bonds shall be a duly authorized surety company, licensed in the State of Arkansas, and satisfactory to the Owner.

12. **Power of Attorney**

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and dated copy of their power of attorney.

13. **Notice of Special Conditions**

Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

- Bonding and Insurance Requirements
- General Conditions of the Contract
- Regulatory Requirements
- Wage Rates

14. **Laws and Regulations**

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

15. **Method of Award-Lowest Qualified Bidder**

If, at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the Owner as available to finance the contract, the contract will be awarded on the base bid only. If such bid exceeds such amount, the Owner may reject all bids or may award the contract on the base bid combined with such deductible alternates (if applicable) applied in the numerical order specified by the contract documents, as produces a net amount within the available funds.

16. **Obligation of Bidder**

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect of his bid.

17. **Safety Standards and Accident Prevention**

With respect to all work performed under this contract, the contractor shall

- Comply with the safety standards provisions of applicable laws, building and construction codes and the Manual of Accident Prevention in Construction: published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596 and the requirement of Title 29 of the Code of Federal Regulations, Section 1518, as published in the Federal Register, Volume 36, No. 75, Saturday, April 17, 1971), and specifically OSHA's Standard for Excavation and Trench Safety Systems, 29 CFR Part 1926, Subpart P.
- Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.
- Maintain at his office or other conspicuous place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site.

For Contracts with Excavation in Excess of 5 Feet

- A separate lump sum bid item must be included for Excavation/Trench Safety System (for excavation in excess of 5'). Bidder is required to complete this pay item in accordance with Act 291 of the Arkansas 79th General Assembly.
- In the event a bidder fails to complete this pay item, the Owner shall declare that the bid fails to comply fully with the provisions of the specifications and bid documents and will be considered invalid as a nonresponsive bid. Payment for the lump sum bid item for Excavation/Trench Safety System will be paid at the completion of the contract. No partial payments will be allowed thereunder.

Attachment 1D
Bid Package for ACEDP Funded Projects
Bid for Lump-Sum Contract

Manila, Mississippi County, Arkansas

Manila Senior Center

Airport Road, Manila, AR 72442

ACEDP Grant #790-08840-14

As bidder

(Insert name of corporation, partnership or individual) in accordance with your invitation for bids for construction of the above-identified project, having examined all contract documents and the site of the proposed work, and being familiar with all of the conditions surrounding construction of the proposed project including availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies and to construct the project in accordance with the contract documents, within the time set forth therein, and at the price(s) stated below. Such price(s) shall cover all expenses incurred in performing the work required by the contract documents, of which this proposal is part.

The bidder hereby agrees to commence work under this contract within 10 days after receiving a Notice to Proceed from the Owner and to fully complete the project within Three Hundred Sixty Five (365) consecutive calendar days thereafter as stipulated in the specifications. The bidder further agrees to pay as liquidated damages, the sum of **\$100.00** for each consecutive calendar day thereafter.

The bidder acknowledges receipt of the following addendum:

Base Proposal

The Bidder agrees to perform all of the work contained in these contract documents for a Lump Sum Total Bid Base of _____ (\$ _____). (Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)

If excavation/trench safety is required, a separate line item shall be provided as

Excavation/Trench Safety (See General Conditions of Contract)

\$ _____

TOTAL BID \$ _____

“ _____ ”

The above price(s) shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the complete project.

DEDUCTIVE ALTERNATIVES

Deductive alternatives are **required for all projects.**

Deductive Alternate No 1: Corridor 104 to be an open walkway with canopy. glass on north side to be removed and columns added as noted in floor plan. south wall to be removed from finish floor to 8'-0" a.f.f., see section 3/a5.1. Use Door 102 Alternate. Deduct the sum of: \$ _____

“ _____ ”

Total Base Bid minus Deductive Alternate No.1(\$ _____)

“ _____ ”

Deductive Alternate No 2: Remove Corridor 104 in its entirety. Use Door 102 Alternate. Deduct the sum of: (\$ _____)

“ _____ ”

Total Base Bid minus Deductive Alternate No.2

(\$ _____)

“ _____ ”

Deductive Alternate No 3: Covered patio on north end to be reduced to 6'-0" in lieu of 10'-0" as shown on floor plan

Deduct the sum of:(\$ _____)

“ _____ ”

Total Base Bid minus Deductive Alternate No.3 \$ _____

“ _____ ”

The bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 calendar days after the bid opening.

Upon receipt of written notice of acceptance of this bid, bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required by the General Conditions.

The bid security attached in the sum of \$ _____ is to become the property of the Owner in the event the contract and bond are not executed within the time set forth above, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Respectfully submitted:

By: _____
(Signature)

By: _____
(Signature)

Company DUNS Number

(Please Print Name of Owner/Contractor)

Individual/Company Tax ID Number

(Seal - if bid is by a corporation)

(Title)

(Business Address and Zip Code)

(Date)

Attachment 1E
Bid Package for ACEDP Funded Projects
Certification of Bidder Regarding Equal Employment Opportunity

This certification is required pursuant to Executive Order 11246 (30 FR 12319-25) which provides that any bidder or prospective contractor or any of their proposed subcontractors, shall state as an initial part of the bid whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and if so, whether it has filed all compliance reports due under applicable instructions. Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven (7) calendar days after bid opening. **No contract shall be awarded unless such report is submitted.**

Certification by Bidder
Name and Address of Bidder (Including Zip Code)

<i>Name and Title of Bidder's Agent</i>

1. Has the bidder participated in a previous contract or subcontract subject to the Equal Opportunity Clause?
Yes No

2. Were compliance reports required to be filed in connection with such contract or subcontract?
Yes No

3. Has the bidder filed all compliance reports due under applicable instructions?
Yes No N/A

4. Has the bidder ever been or is being considered for sanction due to violation of Executive Order 11246, as amended?
Yes No

<i>Signature and Title of Bidder's Agent</i>	<i>Date</i>

Attachment 1F
Bid Package for ACEDP Funded Projects
Contractor Section 3 Certification

_____ (*Name of contractor*) agrees to implement the following specific affirmative steps directed at increasing the utilization of lower income residents and businesses within the City of Trumann, Poinsett County, Arkansas.

- A. To implement Section 3 requirements by seeking the assistance of local officials in determining the exact boundaries of the applicable project area
- B. To attempt to recruit from within the City/County the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within or serving the project area
- C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists
- D. To insert this Section 3 plan in all bid documents, and to require all bidders to submit a Section 3 affirmative action plan (when contracts exceed \$10,000) including utilization goals and the specific steps planned to accomplish these goals
- E. To formally contact unions, subcontractors, and trade associations to secure their cooperation for this project
- F. To ensure that all appropriate project area business concerns are notified of pending subcontractual opportunities
- G. To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken
- H. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 plan
- I. To list on the Estimated Project Workforce Breakdown form, all projected workforce needs for this project by job classification

As officers and representatives of _____

(*Name of contractor*)

We, the undersigned, have read and fully agree to the above and become a party to the full implementation of this program.

Title

Date

Signature

Attachment 1G
Bid Package for ACEDP Funded Projects
Estimated Project Workforce Breakdown

Job Category	Total Estimated Positions	No. of Positions Currently Occupied by Permanent Employees	No. of Vacant Positions	No. of Positions to be Filled With LIPAR (Note 1)*
Officers/Supervisors				
Professionals				
Technicians				
Office				
Clerical				
Trade				
Journeyman				
Apprentices				
Trainees				
Others				
Total				

* Note 1: Lower Income Project Area Residents. Individuals residing within the City of Trumann, Poinsett County, Arkansas whose family income does not exceed 80 percent of the median income in the area.

Company

Attachment 1H
Bid Package for ACEDP Funded Projects
Contract and General Conditions

THIS AGREEMENT, made and entered into this _____ day of _____, 20____, by and between _____, hereinafter called the "Contractor" and _____, hereinafter called the "Owner".

In consideration of the mutual premises and agreements contained herein, the undersigned Contractor and Owner agree as follows:

A. The Contractor shall

1. Furnish all labor, materials, tools, machinery, supervision and services necessary to perform all of the work in accordance with the description of work consisting of all plans, specifications, and supplemental contract documentation, dated _____ for work defined in _____, Arkansas, for the sum of \$_____.
2. Perform all work timely and diligently in a good and workmanlike manner using approved or equal materials as specified by the Grantee.
3. Begin work within 10 calendar days of receipt of the written Notice to Proceed and shall complete the work within Three Hundred calendar days thereafter.
4. Carry Worker's Compensation and Employer's Liability Insurance in accordance with the laws of the State of Arkansas for all persons engaged in work at the site; and carry Contractor's Public Liability and Property Damage Insurance and Comprehensive Automobile Liability Insurance.
5. Furnish, before beginning the work, a Certificate of Insurance showing compliance with the provisions of Section A, Paragraph 4 above.
6. Keep the premises clean and orderly during the work and upon substantial completion of the contract, remove all rubbish, tools, scaffolding, and surplus materials from and about the site(s) and leave the work and premises consistent with prior appearance or equivalent. Material and equipment that have been removed and replaced as part of the work shall belong to the contractor.

Not assign the contract without written consent from the Owner.

8. Guarantee the work performed for a period of twelve months from the date of final acceptance of all work required by this contract. Furthermore,

furnish the Owner and the Grantee with all manufacturer's and supplier's written guarantees and warranties covering materials and equipment furnished under this contract.

9. Furnish the Owner, upon completion of the work and upon final payment by the Owner, a Release of Lien Form certifying that all charges for materials, labor, and/or any other expenses incurred by the Contractor pertaining to the execution of this contract have been paid in full.
10. Defend, indemnify and hold harmless the Owner, the Arkansas Economic Development Commission, their agents or employees from and against any and all claims for injuries or damages to persons or property of any kind or character, whatsoever, whether real or asserted, arising out of the performance of this contract. Furthermore, shall assume all liability and responsibility for injuries, claims or suits for damages, to persons or property of any kind or character, whatsoever, whether real or asserted, arising out of the performance of this contract.

B. The Owner shall

1. Not make, or permit to be made, any changes to the description of work, without written approval from the Economic Development Commission.
2. Permit the contractor to use existing utilities such as lights, heat, power and water necessary to carry out and complete the work as specified.
3. Cooperate with the contractor to facilitate the performance of the work.
4. Issue a written Notice to Proceed to the contractor within ten (10) days from the date of this agreement.

C. Method of Compensation:

1. Payment for work shall be on percentage complete, plus on-site stored materials minus retainage. Final payment shall be made after: a Certificate of Substantial Completion has been executed; Economic Development Commission has received the contractor's Final Invoice and a satisfactory release of liens, or claims for liens, by subcontractors, laborers and material supplies for completed work or installed materials; and, after a final inspection has been conducted.
2. The contractor shall be liable for and shall pay to the Owner the sum of \$_____ as fixed, agreed and liquidated damages for each calendar day of delay from the above stipulated completion date (Section A, Paragraph 3) or as modified by a properly executed Change Order until such work is satisfactorily completed and accepted by the Owner and Grantee.

D. General Provisions:

1. The contractor agrees to perform all contract work as specified, and the Owner agrees that neither he nor the members of his family, his tenants, agents, or employees will hinder the contractor or his work.
2. The contractor shall take affirmative steps to ensure that applicants for employment are not discriminated against in any manner prescribed by the Regulatory Requirements of this contract during employment. Employment activities shall include, but not be limited to employment, upgrading, demotion, or transfer; termination, rates of pay or other forms of compensation; and selection for training, including apprenticeship.
3. The contractor shall post in conspicuous places, for employees and applicants for employment, notices setting forth the provisions, as stated, of the non-discrimination clause contained within the contract's Regulatory Requirements.
4. The contractor shall incorporate the foregoing requirements in all subcontracts.
5. In the event of any breach of this contract by the contractor, the Owner and the Grantee may, at their option, engage the services of another contractor to complete the work and deduct the cost of such completion from any amount due the contractor.
6. This contract embodies all of the representations, rights, duties, and obligations of the parties hereto, and any prior oral or written agreement not embodied herein shall not be binding upon or endure to the benefit of any of the parties

**This Contract and All Terms and Conditions Contained Herein
Are Approved and Accepted as of the Date First Above Written.**

(Seal)

Attest: _____ *(Owner)*

By _____

(Secretary)

(Witness) *(Title)*

(Seal)

Attest: _____ *(Contractor)*

By _____

(Secretary)

(Witness) *(Title)*

Attachment II
Bid Package for ACEDP Funded Projects
Bonding and Insurance Requirements

- 1.1 This section defines **ACEDP grant requirements for bonding and insurance**. No other bonding and insurance requirements, unless specified by State law, shall be imposed.
- 2.1 Entities receiving Federal assistance which involves contracting for construction or facility improvements shall follow State law relating to bid guarantees, performance bonds, and payment bonds except for contracts exceeding \$100,000. **For contracts exceeding \$100,000, the following minimum bonding requirements shall apply:**
 - 2.1.1 A bid guarantee from each bidder equivalent to 5 percent of the bid price. The "**bid guarantee**" shall consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of his bid, execute such contractual documents as may be required within the time specified.
 - 2.1.2 A "**performance bond**" furnished by the contractor in an amount at least equal to 100 percent of the contract price as security for faithful performance of the contract.
 - 2.1.3 A "**payment bond**" in an amount not less than 100 percent of the contract price or in a penal sum not less than that prescribed by State law, to assure contractor payment of all persons performing labor on the project under this contract and/or furnishing materials and supplies during the execution of this contract.

The performance bond and the payment bond may be in one or in separate instruments in accordance with State law.

- 3.1 Where bonds are required as per section 2.1 above, the bonds shall be obtained from **acceptable companies** holding certificates of authority within the State of Arkansas.
- 4.1 **Additional or Substitute Bond** If, at any time, the Owner, for justifiable cause, shall be dissatisfied with any surety or sureties, then upon the Performance or Payment Bonds, the contractor shall within five (5) days after notice of dissatisfaction, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond(s) shall be paid by the contractor. No further payments shall be deemed due nor made until the new surety or sureties furnish acceptable bond(s) to the Owner.

- 5.1 **Insurance** The contractor shall not commence work under this contract until he has obtained all insurance, as approved by the Owner, required under this paragraph, nor shall the contractor allow any subcontractor to commence work on his subcontract until the subcontractor's required insurance has been obtained and approved.
- 5.1.1 **Compensation Insurance:** The contractor shall procure and maintain throughout this contract Workmen's Compensation Insurance as required by applicable State law for all of his employees engaged in work at the site of the project under this contract and, in case of any such work sublet, the contractor shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees engaged in such work unless such employees are covered by the protection afforded by the contractor's Workman's Compensation Insurance. In case any class of employees engaged in hazardous work under this contract is not protected under the Workmen's Compensation Statute, the contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of his employees as are not otherwise protected.
- 5.1.2 **Contractor's Public Liability and Property Damage and Vehicle Liability Insurance:** The contractor shall procure and shall maintain during the life of this contract Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in amounts specified in the contract conditions.
- 5.1.3 **Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance:** The contractor shall either (1) require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in the Supplementary Contract Conditions or, (2) obtain policy insurance on such activities as specified in subparagraph 5.1.2 above.
- 5.1.4 **Scope of Insurance and Special Hazards:** The insurance required under subparagraphs 5.1.2 and 5.1.3 above shall provide adequate protection for the Contractor and his subcontractors, respectively, against damage claims which may arise from operations under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him and, also against any of the special hazards, if specified, which may be encountered in the performance of this contract.
- 5.1.5 **Risk Insurance:** The Owner or contractor may be required to maintain Risk Insurance on a 100 percent completed value based on the insurable portion of the project (until accepted by the Owner as substantially complete) for the benefit of the Owner, the Contractor, or subcontractors

as their interests may appear. Any requirements pertaining to adequacy of Risk Insurance shall be as per State law.

- 5.1.6 **Proof of Carriage of Insurance:** The contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by the Owner."

Attachment 1J
Bid Package for ACEDP Funded Projects
Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
_____ as Principal,
and _____ as Surety,
are hereby held and firmly bound unto _____, as
Owner, in the penal sum of _____
for the payment of which, well and truly to be made, we hereby jointly and severally bind
ourselves, our heirs, executors, administrators, successors and assigns.
Signed, this _____ day of _____, 20__.

The condition of the above obligation is such that whereas the Principal has submitted to
_____ a certain Bid, attached hereto and hereby
made a part hereof to enter into a contract in writing, for the

NOW, THEREFORE.

- A. If said Bid shall be rejected, or in the alternate,
- B. If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract specified (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Surety

Surety's Agent

Principal

Seal

Note: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570, as amended) as authorized to transact business in Arkansas and have underwriting authority in an amount equal to or greater than the bid amount.

Attachment 1K
Bid Package for ACEDP Funded Projects
Arkansas Statutory Payment and Performance Bond

We

_____,
as Principal, hereinafter called Principal, and _____,
authorized to do business in the State of Arkansas, as Surety, hereinafter called Surety,
are held and firmly bound unto _____
as Obligee, hereinafter called Owner, in the amount of

Dollars (\$ _____), for the payment whereof Principal and Surety bind
themselves, their heirs, personal representatives, successors and assigns, jointly and
severally, by these presents.

Principal has by written agreement dated _____ entered into a contract with
Owner for _____

which contract is by reference made a part hereof and hereinafter referred to as the
Contract.

THE CONDITION OF THIS OBLIGATION is such that if the Principal shall faithfully perform the Contract on his part and shall fully indemnify and save harmless the Owner from all cost and damage which he may suffer by reason of failure to do so and shall fully reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any such default, and further, that if the Principal shall pay all persons all indebtedness for labor or materials furnished or performed under said Contract, failing which such persons shall have a direct right of action against the Principal and Surety, jointly and severally, under this obligation, subject to the Owner's priority, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

No suit, action or proceeding shall be brought on this bond outside the State of Arkansas. No suit, action or proceeding shall be brought on this bond except by the Owner after six months from the date final payment is made on the Contract, nor shall any suit, action or proceeding be brought by the Owner after two years from the date on which the final payment under the Contract falls due.

Any alterations which may be made in the terms of the Contract, or in the work to be done under it, or the giving by the Owner of any extension of time for the performance of the Contract, or any other forbearance on the part of either the Owner or the Principal to

the other shall not in any way release the Principal and the Surety or Sureties, or either or any of them, their heirs, personal representatives, successors or assigns from their liability hereunder, notice to the Surety or Sureties of any such alteration, extension or forbearance being hereby waived.

In no event shall the aggregate liability of the Surety exceed the sum set out herein.

Executed on this _____ day of _____, 20__

Principal

Surety Agent

Attorney-in-Fact

Attachment 1L
Bid Package for ACEDP Funded Projects
Certificate of Owner's Attorney

I, the undersigned, _____, the duly
authorized and acting legal representative of _____
_____, do hereby
certify as follows:

I have examined the attached contract(s) and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

Attorney Signature

Date

Attachment 1M
Bid Package for ACEDP Funded Projects
General Conditions of the Contract

1.1 Definitions

1.1.1 Contract and Contract Documents

The project to be constructed pursuant to this contract will be financed with assistance from Community Development Block Grant funds and is subject to all applicable Department of Housing and Urban Development (HUD), State and Federal laws.

The plans, specifications, contract documents and any addenda shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were incorporated verbatim. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or infer interpretation of the provisions to which they refer.

1.2 Execution

1.2.1 Six copies of the Contract Documents shall be signed by the Owner and contractor.

1.2.2 Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

1.3 Contract Authorization

1.3.1. All original Drawings and Specifications will remain in the ownership of the architect or engineer. Notice and description of any changes to the original documents or scope of work by the contractor shall be communicated to the architect/engineer prior to completion of the affected work.

1.3.2 The Owner, architect/engineer and funding agencies shall have access to the construction site at all times and shall make site visits as necessary to verify project progress.

1.3.3 The architect/engineer shall make, or have made, determinations that the work for each payment request is or is not complete and meets the requirements of the contract documents. The request for payment process shall be defined at the Preconstruction Conference.

- 1.3.4 The architect/engineer shall have the authority to request corrections to deficient work by notifying the contractor in writing.
- 1.3.5 The contractor shall meet the requirements of all State, Federal and local laws including, but not limited to those listed in these contract documents as **Regulatory Requirements**.
- 1.3.6 The architect/engineer shall give all orders and directions under this contract, relative to execution of work including the amount, quality, acceptability, and fitness of the work and materials which are to be paid for under this contract and shall decide all questions which may arise in relation to work and the construction thereof. The architect or engineer's decisions shall be final and conclusive, except as State law may otherwise prescribe. Any differences or conflicts in regard to the contract documents that may arise between the contractor performing work for the architect/engineer shall be adjusted and determined by the architect/owner after consultation with the contractor.
- 1.3.7 All work and materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Owner, engineer or architect or representative(s) thereof, who shall adjudge the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet their approval they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the contractor at his own expense. Rejected material shall immediately be removed from the site. If, in the opinion of the architect/engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the contract documents, the compensation to be paid to the contractor shall be reduced by such amount adjudged by the architect/engineer as equitable.
- 1.3.8 No claim for extra work or cost shall be allowed unless authorized by change order executed by the engineer/architect and approved by the Owner and the Economic Development Commission. In the event of temporary suspension of work, or during inclement weather, or whenever the engineer or architect shall direct, the contractor will, cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the architect/engineer, any work or materials were damaged or injured by reason of failure on the part of the contractor or any of his subcontractors, such materials shall be removed and replaced at contractor expense.
- 1.3.9 Should the contractor encounter site conditions that differ from the contract documents, he shall immediately give notice to the

architect/engineer before commencing work on the affected properties. The architect/engineer will thereupon investigate, or have investigated the conditions, and if found that they materially differ from those shown in the contract documents, will request changes as deemed necessary. Any increase or decrease of cost resulting from such changes shall be adjusted as per the General Conditions.

2.1 Definitions

- 2.1.1 The following terms as used in this contract are respectively defined as follows:
- 2.1.2 **Contractor:** A person, firm or corporation with whom the owner contracts with.
- 2.1.3 **Subcontractor:** A person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, and under separate contract or agreement with the contractor.
- 2.1.4 **Work on (at) the project:** Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the contractor and any subcontractor.

3.1 Contractor's Responsibilities

- 3.1.1 The contractor shall and will, in good workmanlike manner, complete and perform all work and furnish all supplies, materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary to perform and complete all the work required by this contract. He shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required.

The contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the contract documents, and complete the entire work to the satisfaction of the engineer/architect and Owner.

It is understood that unless otherwise specifically stated in the contract documents, the contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every kind, and all other services and facilities of every kind whatsoever necessary to execute, complete, and deliver the complete project within the specified time. Any work necessary to be performed after regular working hours, on Sundays or legal Holidays, shall be performed without additional Owner expense.

3.1.2 The contractor shall at all times safe guard the Owner's property from injury or loss in connection with this contract. He shall at all times safe guard and protect his own work, and that of adjacent property from damage. In case of emergency, which threatens loss or injury of property, and/or safety or life, the contractor will be allowed to act, without previous instructions from the architect/engineer, in a diligent manner. He shall notify the engineer/architect of actions immediately thereafter. Any claim for compensation by the contractor due to such extra work may be submitted to the architect/engineer for approval and Owner for consideration. Where the contractor has not taken action but has notified the architect/engineer of an emergency threatening injury to persons or damage to the work or any adjoining property, he shall act as instructed or authorized by the architect/engineer.

The amount of reimbursement to the contractor on account of any emergency action shall be determined in the manner provided in the general conditions.

3.2 **Contractor Requirements**

The contractor shall

3.2.1 Take every precaution against injuries to persons or damage to property;

3.2.2 Store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work or elsewhere as will not unduly interfere with the progress of his work or the work of any other contractors;

3.2.3 Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance;

3.2.4 Before final payment, remove all surplus material, temporary structures, equipment and debris of every nature resulting from his operations, and to put the site in an orderly condition;

3.2.5 Effect all cutting, fitting or patching of his work to conform to the contract documents.

3.2.6 No materials or supplies for the work shall be purchased by the contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which interest is retained by the seller. The contractor warrants that he has good title to all materials

and supplies used by him in the work, free from all liens, claims or encumbrances.

- 3.2.7 The contractor shall not assign the whole or any part of this contract or any moneys due or to become due hereunder without written consent of the Owner. In case the contractor assigns all or any part of any moneys due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the contractor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this contract.
- 3.2.8 If, through contractor neglect, any other contractor or subcontractor suffers loss or damage on the work, the contractor agrees to settle with such other parties by agreement or arbitration if such parties will so settle. If such other contractors or subcontractors shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the contractor, who shall indemnify and save harmless the Owner against any such claim.
- 3.2.9 Neither the final certificate of payment nor any provision in the contract documents, shall constitute an acceptance of work not completed in accordance with the contract documents or relieve the contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The Owner will give notice of observed defects with reasonable promptness.

3.3 Subcontractor's Responsibilities

- 3.3.1 The contractor may hire specialty subcontractors to complete work which, under normal contracting practices, is performed by specialty subcontractors, however, the contractor shall be fully responsible to the Owner for the acts or omissions of his subcontractors, and of persons either directly or indirectly employed by him.
- 3.3.2 The contractor shall coordinate his operations with those of other contractors in the arrangement for storage of materials and in the detailed execution of the work. The contractor, including his subcontractors, shall keep informed of the progress and the detail work of other contractors and shall notify the Owner immediately of lack of progress or defective workmanship on the part of other contractors. Failure of a contractor to

keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory.

3.4 Patents

The contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents. License and/or Royalty Fees for the use of a process which is authorized by the Owner must be reasonable, and paid to the holder of the patent, or his authorized licensee, direct by the Owner and not by or through the contractor.

If the contractor uses any design, device or materials covered by letters, patent or copyright, he shall provide for such use by suitable agreement with the holder of such patented or copyrighted design, device or materials. It is mutually understood that, without exception, the contract price shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The contractor and/or his Sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

3.5 Superintendence

At the site of the work, the contractor shall employ a construction superintendent or foreman who shall have full authority to act for the contractor.

3.6 Conflicting Conditions

Any provisions in any of the contract documents, which may be in conflict, or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.

3.7 Arkansas Economic Development Commission Inspection

Authorized representatives of the Arkansas Economic Development Commission shall be permitted to inspect all work, materials, personnel records, invoices of materials, and other data and records of the contractor and his subcontractor(s).

3.8 Payment Provisions

- 3.8.1 To ensure the proper performance of this contract, the Owner shall retain ten percent (10%) of the amount of each estimate until the project is 50 percent complete. Final retainage shall be released upon acceptance of the Certificate of Substantial Completion.
- 3.8.2 In preparing payment estimates, materials stored on the site and preparatory work completed may be included.
- 3.8.3 The contractor agrees to indemnify and hold the Owner harmless from all claims arising from the lawful demands of subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies incurred in the performance of this contract. The contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the above nature have been paid, discharged, or waived. If the contractor fails to do so, then the Owner may, after having served written notice to the contractor, pay unpaid bills (of which the owner has written notice), and direct, or withhold from the contractor's unpaid compensation, a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the contractor shall be resumed, in accordance with the terms of this contract. In no event shall the above sentences impose any obligations upon the Owner to the contractor or his surety. In paying any unpaid bills of the contractor, the Owner shall be deemed the contractor's agent, and any such payments made by the Owner shall be considered as payment made under the contract to the contractor and the Owner will not be liable to the contractor for any such payments.
- 3.8.4 After execution and delivery of the contract prior to making the first partial payment, the contractor shall deliver to the owner an estimated construction progress schedule in a form satisfactory to the owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the contract documents and the anticipated amount of each monthly payment that will become due in accordance with the progress schedule. The contractor shall furnish on forms supplied by the Owner a detailed estimate giving a complete breakdown of the contract price and periodic itemized estimates of work completed for the purpose of making partial payments thereon. The costs employed in maintaining these schedules will be used only to determine the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

3.8.5 The contractor shall procure and pay all permits, licenses and approvals necessary for the execution of his contract.

4.1 **Changes in Work**

No changes in the work defined within the contract documents shall be made without a change order. Charges or credits for the work covered by the change order shall be determined by one or more, or a combination of the following:

- Unit bid prices previously approved
- An agreed upon lump sum
- The actual cost of labor, including foremen
- Materials entering permanently into the work
- The ownership or rental cost of construction plant and equipment during the time of use on the extra work
- Power and consumable supplies for the operation of power equipment
- Insurance, Social Security and unemployment contributions

4.2 **Additional Instructions and Drawings**

If necessary, the contractor will be furnished additional instructions and drawings to execute contract work. These additional drawings and instructions will be prepared so that they can be generally interpreted as part of the contract documents thereof. Any additional instructions or drawings will be issued to and discussed by all parties and shall be carried out by the contractor as specified.

4.3 **Contractor and Owner**

4.3.1 It is hereby understood and mutually agreed, by and between the contractor and the Owner, that the date of beginning and the time for completion, as specified in the contract, of the work to be completed hereunder, are Essential Conditions of this contract; and it is further mutually understood and agreed that the work to be completed in this contract shall be started on a date to be specified in the "Notice to Proceed."

If the contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension of time granted by the Owner, then the contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount specified in the contract, not as a penalty, but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the contractor shall be in default after the time stipulated in the contract for completing the work.

Provided, that the contractor shall not be charged with liquidated damages or any excess cost where the Owner determines that the contractor is

without fault and the contractor's reasons for the time extension are acceptable to the Owner;

Provided further, that the contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to;

- a. Any preference, priority or allocation order duly issued by the Government;
- b. Unforeseeable cause beyond the control and without the fault or negligence of the contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and documented severe weather; and,
- c. Any delays of subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article;

Provided further, that the contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the contractor within a reasonable time of its decision in the matter.

4.3.2 Should the Owner be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any litigation or other reason beyond the control of the Owner, the contractor shall not be entitled to make or assert claim for damage by reason of said delay; but time for completion of the work will be extended to such reasonable determination to be set forth in writing.

4.3.3 Any notice to any contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said contractor at his last given address, or delivered in person to the said contractor or his authorized representative on the work.

5.1 **Owner**

5.1.1 The Owner is the entity identified in the Owner-Contractor Agreement and is referred to as such in the contract documents. The term Owner means the Owner or his authorized representative.

5.1.2 Prior to the start of construction, the Owner shall obtain all land and rights-of-way necessary for carrying out and completion of work to be performed under this contract. The contractor shall comply with all laws,

ordinances, rules, orders, and regulations relating to performance of the work, the protection of adjacent property, and the maintenance of passageways, guard fences or other protective facilities.

- 5.1.3 Unless otherwise expressly provided for in the contract documents, the Owner will furnish to the contractor all surveys necessary for the execution of the work.
- 5.1.4 No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any contracts or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, attorney, or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other pertinent contract.
- 5.1.5 Should any provisions of this contract be violated by the contractor, or any of his subcontractors, the Owner may serve written notice upon the contractor and the Surety of its intention to terminate the contract. Such notices shall contain the reasons for such intention to terminate the contract, and unless within ten (10) days after the serving of such notice upon the contractor, such violation, or delay shall cease and satisfactory arrangement of correction be made, the contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the Surety and the contractor and the Surety shall have the right to take over and perform the contract; provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same to completion by contract or by force account at the expense of the contractor and the contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefore.
- 5.1.6 The Owner shall meet the requirements of all State, Federal and local laws including but not limited to those listed in these contract documents as Regulatory Requirements.

6.1 Safety Standards and Accident Prevention

With respect to all work performed under this contract, the contractor shall:

- 6.1.1 Comply with the safety standards provisions of applicable laws, building and construction codes and the Manual of Accident Prevention in Construction: published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act (OSHA) of 1970 (Public Law 91-596) and the requirements of Title 29 of the Code of Federal Regulations, Section 1518, as published in the Federal Register, Volume 36, Number 75, Saturday, April 17, 1971, and specifically, OSHA's Standard for Excavation and Trenches Safety Systems, 29 CFR Part 1926, Subpart P.
- 6.1.2 Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.
- 6.1.3 Maintain, at his office or other conspicuous place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site.

7.1 Miscellaneous Provisions

- 7.1.1 The architect/engineer shall review all submittals to include but not be limited to samples, shop drawings and product data. The architect/engineer shall provide the contractor with approved or rejected submittals within ten days of their receipt. The contractor shall retain one copy in his construction files at all times and provide one copy to the resident project representative. Upon completion of the contract, the contractor shall provide the complete submittal file to the owner who will retain them in the permanent construction file. Upon receiving a rejected submittal, the contractor shall resubmit an alternate or provide what was originally specified.
- 7.1.2 The contractor shall insert in any subcontracts the Federal Labor Standards Provisions Contained herein (See Regulatory Requirements) and such other clauses as the Economic Development Commission may deem necessary, and also, a clause requiring subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.
- 7.1.3 The contractor may agree to the use and occupancy of a portion or unit of the project before formal acceptance by the owner provided that the owner

secures written consent of the contractor, except in the event, in the opinion of the architect/engineer, the contractor is chargeable with unwarranted delay in final cleanup of punch list items or other contract requirements. Also, an endorsement of the insurance-carrier and consent of the surety permitting occupancy of the building or use of the project during the remaining period of construction must be secured.

- 7.1.4 All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the owner (in accordance with State procurement requirements) who will pay for all such services direct and exclusive to this contract. Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for uses intended.

Attachment 1N
Bid Package for ACEDP Funded Projects
Supplemental Conditions of the Contract

8.1 Special Hazards

The contractor's and his subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards:

8.1.1 **Contractor's and Subcontractor's Public Liability, Vehicle Liability and Property Damage Insurance.** As required in the General Conditions, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than \$500,000.00 for injuries, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than \$ 500,000.00 on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$ 500,000.00.

8.1.2 The Contractor shall either require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage of the type and in the same amounts as specified in the preceding paragraph, or insure the activities of his subcontractors in his own policy.

8.1.3 The contract documents shall consist of all specifications, plans, contract documents and addenda for the project.

9.1 Supplementary Contract Conditions

Any supplementary conditions of the contract must be inserted below:

Attachment 10
Bid Package for ACEDP Funded Projects
Wage Determination Preface Sheet

(The appropriate Wage Determination(s) requested from the Arkansas Economic Development Commission shall be inserted in place of this page.)

Note: Please contact the Arkansas Economic Development Commission or project administrator, ten (10) days before the date of bid opening to confirm that the issued wage determination(s) is still valid. Modified or superseded wage determinations must be added to the contract.



STATE OF ARKANSAS
ARKANSAS DEPARTMENT OF LABOR
PREVAILING WAGE DIVISION

10421 WEST MARKHAM • LITTLE ROCK, AR 72205-2190
Phone: 501-682-4536 Fax: 501-682-4506 TRS: 800-285-1131

February 15, 2017

Julie Chambers
deMx Architecture
104 N. East Ave.
Fayetteville, AR 72701

Re: MANILA SENIOR CENTER
MANILA, ARKANSAS
MISSISSIPPI COUNTY

Dear Ms. Chambers:

In response to your request, enclosed is Arkansas Prevailing Wage Determination Number **16-401** establishing the minimum wage rates to be paid on the above-referenced project. These rates were established pursuant to the Arkansas Prevailing Wage Law, Ark. Code Ann. §§ 22-9-301 to 22-9-315 and the administrative regulations promulgated thereunder.

If the work is subject to the Arkansas Prevailing Wage Law, every specification shall include minimum prevailing wage rates for each craft or type of worker as determined by the Arkansas Department of Labor Ark. Code Ann. § 22-9-308 (b) (2). Also, the public body awarding the contract shall cause to be inserted in the contract a stipulation to the effect that not less than the prevailing hourly rate of wages shall be paid to all workers performing work under the contract. Ark. Code Ann. § 22-9-308 (c).

Additionally, the scale of wages shall be posted by the contractor in a prominent and easily accessible place at the work site. Ark. Code Ann. § 22-9-309 (a).

Also enclosed is a **"Statement of Intent to Pay Prevailing Wages"** form that should be put in your specifications along with the wage determination. The General/Prime Contractor is responsible for getting this form filled out and returned to this office within 30 days of the Notice to Proceed for this project.

When you issue the Notice to Proceed for this project, please send a copy of the notice to my office.

If you have any questions, please call me at (501) 682-4536 or fax (501) 682-4506.

Sincerely,

A handwritten signature in cursive script that reads "Lorna Kay Smith".

Lorna K. Smith
Prevailing Wage Division

Enclosures

Arkansas Department of Labor Prevailing Wage Determination

Date: 2/15/2017

Determination #: 16-401

Expires: 8/15/2017

Project: Manila Senior Center

Site:

City: Manila, Arkansas

Project County: Mississippi

Survey#: 716-AR11

COUNTY(S) Group

Clay 11

Craighead

Greene

Mississippi

Poinsett

CLASSIFICATION

	Basic Hourly Rate	Fringe Benefits
Asbestos Worker/Insulator	\$15.40	
Boilermaker	\$17.38	\$4.79
Bricklayer/Pointer, Cleaner, Caulker, Stone Mason	\$19.15	
Carpenter	\$14.50	
Concrete Finisher/Cement Mason	\$14.00	
Electrician/Alarm Installer	\$17.50	\$2.10
Glazier	\$12.00	
HVACR Mechanic (Excludes Duct Work)	\$16.45	\$1.15
Ironworker (Including Reinforcing Work)	\$15.00	
Laborer	\$10.35	
Marble/Tile/Terrazzo	\$12.00	
Metal Building Erector	\$15.20	
Millwright	\$15.95	\$3.70
Painter/Sheet Rock Finisher	\$14.30	
Plumber/Pipefitter	\$17.45	\$2.00
Roofer	\$13.25	
Sheet Metal (Includes Duct Work)	\$22.34	\$13.09
Sprinkler Fitter	\$20.60	\$2.95
Group 1 - Operator	\$15.20	\$2.65
Group 2 - Operator	\$16.70	
Group 3 - Operator	\$16.11	
Group 4 - Operator	\$12.00	
Laborer (Brick/Stone Tender)	\$12.00	
Truck Driver (Excludes Dump Truck)	\$15.00	\$3.45
Fence Installer	\$12.00	

Welders-receive rate prescribed for craft performing operation to which welding is incidental.

Certified 7/1/2016

Classifications that are required, but not listed above, must be requested in writing from the Arkansas Department of Labor, Prevailing Wage Division. Please call (501) 682-4536 for a request form.

Power Equipment Operators:

Group I

Operators engaged in operating the following equipment: Cranes, draglines, shovels and piledrivers with a lifting capacity of 50 tons or over, and operators of all tower climbing cranes and derricks required to work 25 feet or over from the ground, blacksmith and mechanics.

Group II

Operators engaged in operating the following equipment or performing work relative to the engineer's jurisdiction: Hydraulic cranes, cherry pickers, backhoes, and all derricks with a lifting capacity less than 50 tons, as specified by the manufacturer, all backhoes, tractor or truck type, all overhead & traveling cranes, or tractors with swinging boom attachments, gradealls all above equipment irrespective of motive power, leverman (engineer), hydraulic or bucket dredges, irrespective of size, trackhoes, excavators.

Group III

Heavy Equipment Operators. Operators engaged in operating the following equipment: all bulldozers, all front end loaders, all sidebooms, skytracks, forklifts, all push tractors, all pull scrapers, all motor graders, all trenching machines, regardless of size or motive power, all backfillers, all central mixing plants, 10S and larger, finishing machines, all boiler fireman high or low pressure, all asphalt spreaders, hydro truck crane, multiple drum hoist, irrespective of motive power, all rotary, cable tool, core drill or churn drill, water well and foundation drilling machines, regardless of size, regardless of motive power and dredge tender operator, asphalt paving machines.

Group IV

Light Equipment Operators. Operators engaged in operating the following equipment: Oilerdriver motor crane, single drum hoists, winches and air tuggers, irrespective of motive power, winch or A frame trucks, rollers of all types and pull tractors, regardless of size, elevator operators inside and outside when used for carrying workmen from floor to floor and handling building material, Lad-A-Vator Conveyor, batch plant, and mortar or concrete mixers, below 10S, end dump euclid, pumpcrete spray machine and pressure grout machine, air compressors, regardless of size. All light equipment, welding machines, light plants, pumps, all well point system dewatering and portable pumps, space heaters, irrespective of size, and motive power, equipment greaser, oiler, mechanic helper, drilling machine helper, asphalt distributor and like equipment, safety boat operator and deckhand.

STATEMENT OF INTENT TO PAY PREVAILING WAGES

PROJECT: **MANILA SENIOR CENTER
MANILA, ARKANSAS
MISSISSIPPI COUNTY**

This is to certify that we, the following listed contractors, are aware of the wage requirements of the Arkansas Prevailing Wage Law and by signature below indicate our intent to pay no less than the rates established by **Arkansas Prevailing Wage Determination Number 16-401** for work performed on the above noted public project. I understand that contractors who violate prevailing wage laws, i.e., incorrect classification/scope of work of workers, improper payments of prevailing wages, etc., are subject to fines and will be required to pay back wages due to workers.

	Business Name	Address	Phone#	Signature and Title of Business Official
General/Prime Contractor				
Electrical Subcontractor				
Mechanical Subcontractor				
Plumbing Subcontractor				
Roofing/ Sheet Metal Subcontractor				

THE GENERAL/PRIME CONTRACTOR IS RESPONSIBLE FOR GETTING THIS FORM FILLED OUT AND RETURNING IT TO THE ARKANSAS DEPARTMENT OF LABOR ***WITHIN 30 DAYS OF THE NOTICE TO PROCEED*** FOR THIS PROJECT. RETURN COMPLETED FORM TO THE ARKANSAS DEPARTMENT OF LABOR, PREVAILING WAGE DIVISION, 10421 W. MARKHAM, LITTLE ROCK, ARKANSAS, 72205.

Attachment 1P
Bid Package for ACEDP Funded Projects
Architect's Certification of Compliance with Minimum Standards
for Access by Handicapped

ACEDP Grant #790-08840-14

Project Name: Manila Senior Center

City/County, State: City of Manila, Mississippi County, Arkansas

Pursuant to the requirements of the Architectural Barriers Act of 1968, 42 USC 4151, and the regulations issued subsequent thereto, including the Americans with Disability Act, the undersigned certifies that the design of the above-referenced project is in conformance with the minimum standards contained in the American Standard Specifications for Making Buildings and Facilities Accessible To and Usable By the Physically Handicapped, Number A-117.1R-1971 (as modified by 41 CFR 101-19.603).

Name and Address of Project Architect:

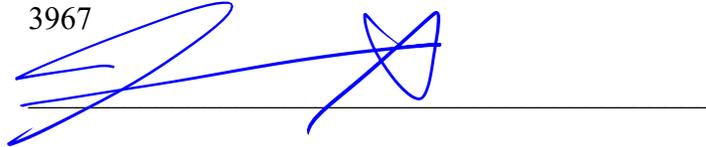
deMx architecture

104 N. East Avenue

Fayetteville, AR 72701

Registration Number: 3967

Signature:



Typed Name: Timothy W. Maddox

Date: March 28, 2017

Attachment 1Q
Bid Package for ACEDP Funded Projects
Regulatory Requirements

1.1 Interest of Member or Delegate to Congress

No member of or Delegate to Congress, or Resident Commissioner, shall be a party to or benefit from this contract, except that provisions of this clause shall not extend to situations where the contract accrues to a corporation for its general benefit.

1.2 Equal Employment Opportunity

1.2.1 During the performance of this contract the contractor agrees as follows:

The contractor will not discriminate against any employee or applicant for employment because of age, race, religion, sex, color, handicap, veteran status or national origin. The contractor will take affirmative steps to ensure that applicants are employed, and that employees are treated during employment, without regard to their age, race, religion, sex, color, handicap, veteran status or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms or compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

1.2.2 The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, religion, sex, color, handicap, veteran status or national origin.

1.2.3 The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the labor union or workers representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965 (EO 11246), and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

1.2.4 The contractor will comply with all provisions of EO 11246, and of the rules, regulations, and relevant orders of the Secretary of Labor.

1.2.5 In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders,

this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or Federally-assisted construction contracts.

- 1.2.6 The contractor will include the provisions of these paragraphs in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of EO 11246, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Economic Development Commission and HUD may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by HUD, the contractor may request the United States to enter into such litigation to protect its interests.

1.3 **Employment Practices**

The contractor shall

- 1.3.1 To the greatest extent practicable, follow hiring and employment practices for work on the project, which will provide new job opportunities for the unemployed and underemployed (Section 3 requirements).
- 1.3.2 Insert or cause to be inserted the same provisions in each construction subcontract.

2.1 **Special Equal Opportunity Provisions**

- 2.1.1 **Activities and Contracts Not Subject to EO 11246, as Amended** (Applicable to Federally assisted construction contracts and related subcontracts *under \$10,000*). During the performance of this contract, the contractor agrees to incorporate the following requirements into all subcontracts:

- 2.1.1.1 The contractor shall not discriminate against any employee or applicant for employment because of age, race, religion, sex, color, handicap, veteran status or national origin. The contractor shall take affirmative steps to ensure that applicants for employment are employed, and that employees are treated during employment, with regard to their age, race, religion, sex, color, handicap, veteran status or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

2.1.1.2 The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided, setting forth the provision of this nondiscrimination clause. The notice shall state that all qualified applicants will receive consideration for employment without regard to age, race, religion, sex, color, handicap, veteran status or national origin.

2.2.1 **Contracts Subject to EO 11246, as Amended** (Applicable to Federally assisted construction contracts and related subcontracts *exceeding \$10,000*). During the performance of this contract, the contractor agrees as follows:

2.2.1.1 The contractor will not discriminate against any employee or applicant for employment because of age, race, religion, sex, color, handicap, veteran status or national origin. The contractor will take affirmative steps to ensure that applicants are employed, and that employees are treated during employment, without regard to their age, race, religion, sex, color, handicap, veteran status or national origin, Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

2.2.1.2 The contractor will in all solicitations or advertisements for employees placed by or on his behalf, state that all qualified applicants will receive consideration for employment without regard to age, race, religion, sex, color, handicap, veteran status or national origin.

2.2.1.3 The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the labor union or workers' representatives of the contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

- 2.2.1.4 The contractor will comply with all provisions of EO 11246, and of the rules, regulations and relevant orders of the Secretary of Labor.
- 2.2.1.5 The contractor will furnish all information and reports required by EO 11246, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Arkansas Economic Development Commission, HUD, and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- 2.2.1.6 In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract, or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or Federally-assisted construction contracts.
- 2.2.1.7 The contractor will include all provisions of the seven paragraphs immediately above in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of EO 11246, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Division may direct as a means of enforcing such provisions, including sanctions for noncompliance provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Division, the contractor may request the United States to enter into such litigation to protect its interests.

**"Section 3" Compliance in the Provision
of Training, Employment and Business Opportunities**

3.1.1 During the performance of this contract, the contractor agrees as follows:

3.1.1.1 The contractor agrees to comply with the requirements of Section 3 of the Housing and Urban Development Act of 1968, 12 USC 170 (u), as amended, the HUD regulations issued pursuant thereto at 24 CFR 135, and any applicable rules and orders of HUD issued thereunder.

3.1.1.2 The "Section 3 clause" set forth in 24 CFR 135.20 (b) shall form part of this contract, as set forth in the General Conditions.

3.1.1.3 Contractors shall incorporate the "Section 3 clause" shown below and the foregoing requirements in all subcontracts.

Section 3 Clause as Set Forth in 24 CFR 135.20(b)

The work to be performed under this contract is on a project funded with Federal financial assistance from HUD and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 170(u). Section 3 requires that to the greatest extent feasible, opportunities for training and employment will be given to lower income residents of the project area and, contracts for work in connection with the project be awarded to business concerns which are located in or substantially owned by persons residing in the project area.

The parties to this contract will comply with the provisions of Section 3 and the regulations issued pursuant thereto by the Secretary of HUD set forth in 24 CFR 135, and all applicable rules and orders of the Division issued there under prior to the execution of this contract. The parties to this contract certify and agree that they are under no contractual or other disability, which would prevent them from complying with these requirements.

The contractor will send to each labor organization or workers' representative with which he has a collective bargaining agreement or other contract or understanding, a notice advising them of his commitments under Section 3 and will post copies of the notice in conspicuous places available to employees and applicants for employment or training.

The contractor will include this Section 3 clause in every subcontract for work in connection with the project and will, at the direction of the applicant for or recipient of Federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations

issued by HUD, 24 CFR 135. The contractor will not subcontract with any subcontractor where it has notice or knowledge that the latter has been found in violation of regulations under 24 CFR 135, and will not let any subcontract unless the subcontractor has first provided it with a preliminary statement of ability to comply with the requirements of these regulations.

Compliance with Section 3 provisions, the regulations set forth in 24 CFR 135, and all applicable rules and orders of the Division issued there under prior to the execution of the contract, shall be a condition of the Federal financial assistance provided to the project, binding upon the applicant or recipient for such assistance, its successors and assigns. Failure to fulfill these requirements shall subject the applicant or recipient, its contractors and subcontractors, its successors, and assigns to those sanctions specified by the grant or loan agreement or contract through which Federal assistance is provided, and to such sanctions as are specified by 24 CFR 135.

4.1 Access to Records/Maintenance of Records

The contractor shall maintain accounts and records, including personnel, property, and financial records, adequate to identify and account for all costs pertaining to the contract and such other records as may be deemed necessary by the locality to assure proper accounting for all funds. These records will be available for audit purposes to the locality or the State or any other authorized representative, and will be retained for three years after contract completion. Moreover, the locality, State, or any authorized representative shall have access to any books, documents, papers, and records of the contractor which are directly pertinent to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

5.1 Conflict of Interest of Officers or Employees of the Local Jurisdiction, Members of the Local Governing Body, or Other Public Officials

No officer or employee of the local jurisdiction or its designees or agents, no member of the governing body, and no other public official of the locality who exercises any function or responsibility with respect to this contract, during his/her tenure or for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, for work to be performed. Further, the contractor shall cause to be incorporated in all subcontracts the language set forth in this paragraph prohibiting conflict of interest.

6.1 Section 503 of the Rehabilitation Act of 1973 (If \$2,500 or Over)

6.1.1 The contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The contractor agrees to take affirmative steps to employ, advance in employment and otherwise treat qualified handicapped individuals without

discrimination based upon their physical or mental handicap in all employment practices such as the following: employment upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

- 6.1.2 The contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
 - 6.1.3 In the event of the contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
 - 6.1.4 The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices stating the contractor's obligation under the law to take affirmative steps to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.
 - 6.1.5 The contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement of other contract understanding, that the contractor is bound by the terms of Section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative steps to employ and advance in employment physically and mentally handicapped individuals.
 - 6.1.6 The contractor will include the provisions of this clause in every subcontract or purchase order of \$2,500 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to Section 503 of the Act, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Director of the office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance.
- 7.1 **Section 402 Veterans Readjustment Assistance Act of 1973 (If \$10,000 or Over)**
- 7.1.1 **Affirmative Steps for Disabled Veterans and Veterans of the Vietnam Era**
 - 7.1.1.1 The contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era in regard to any position for which the employee or applicant for employment is qualified. The

contractor agrees to take affirmative steps to employ, advance in employment and otherwise treat qualified disabled veterans and veterans of the Vietnam era without discrimination based upon their disability or veteran status in all employment practices such as the following: employment upgrading, demotion or transfer, recruitment, advertising, layoff or termination, and selection for training, including apprenticeship.

- 7.1.1.2 The contractor agrees that all suitable employment openings which exist at the time the contract is executed and those which occur during the performance of this contract (including those not generated by this contract and including those occurring at an establishment of the contractor other than the one wherein the contract is being performed but excluding those of independently operated corporate affiliates) shall be listed at an appropriate local office of the State employment service system wherein the opening occurs. The contractor further agrees to provide reports to local offices regarding employment openings and hires as may be requested.
- 7.1.1.3 State and local government agencies holding Federal contracts of \$10,000 or more shall also list all their suitable openings with the appropriate office of the State employment service.
- 7.1.1.4 Listing of employment openings with the employment service system pursuant to this clause shall be made at least concurrently with the use of any other recruitment source or effort and shall involve the normal obligations which attach to the placing of a bona fide job order, including the acceptance of referrals of veterans and non-veterans. The listing of employment openings does not require the hiring of any particular job applicant or selection from any particular group of job applicants, and nothing herein is intended to relieve the contractor from any requirements in Executive Orders or regulations regarding nondiscrimination in employment.
- 7.1.1.5 The reports required in regard to this clause shall include, but not be limited to, periodic reports which shall be filed at least quarterly with the appropriate local office, or where the contractor has more than one hiring location in a State, with the central office of that State employment service. Such reports shall indicate for each hiring location (1) the number of individuals hired during the reporting period, (2) the number of nondisabled veterans of the Vietnam era hired, (3) the number of disabled veterans of the Vietnam era hired, and (4) the total number of disabled veterans hired for on-the-job training under 38 U.S.C. 1787. The contractor

shall submit a report within 30 days after the end of each reporting period wherein any performance is made of this contract identifying data for each hiring location. The contractor shall maintain at each hiring location copies of the reports submitted until the expiration of one year after final payment under the contract, during which time these reports and related documentation shall be made available, upon request, for examination by any authorized representative of the contracting officer for of the Secretary of Labor. Documentation would include personnel records respecting job openings, recruitment and placement.

7.1.1.6 Whenever the contractor is subject to the listing provisions of this clause, it shall advise the employment service system in each State where it has establishments of the name and location of each hiring location in the State. As long as the contractor is subject to these provisions and has so advised the State system, there is no need to advise them of subsequent contracts. The contractor may inform the State system when it is no longer bound by this contract clause.

7.1.1.7 This clause does not apply to the listing of employment openings occurring and filled outside the 50 States, the District of Columbia, Puerto Rico, Guam and the Virgin Islands.

7.1.1.8 The provisions of this clause do not apply to openings, which the contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union firing arrangement. This exclusion does not apply to a particular opening since an employer decides to consider applicants outside of his own organization or employer-union arrangement for that opening.

7.1.1.9 The phrase "All suitable employment openings" includes, but is not limited to, openings which occur in the following job categories; production and nonproduction; plans and office; laborers and mechanics; supervisory and nonsupervisory; technical; and executive administrative and professional openings compensated on a salary basis of less than \$25,000 per year. This term includes full-time employment, temporary employment of more than 3 days' duration, and part-time employment. It does not include openings which the contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement nor openings in an educational institution which are restricted to students of the institution. Under the most compelling circumstances, an employment opening may not be

suitable for listing, including such situations where the needs of the Government cannot reasonably be otherwise supplied, where listing would be contrary to national security, or where the requirement of listing would otherwise not be for the best interest of the Government.

- 7.1.1.10 "Appropriate office of the State employment service system" means the local office of the Federal-State national system of public employment offices with assigned responsibility for serving the area where the employment openings are to be filled, including the District of Columbia, Guam, Puerto Rico, and the Virgin Islands.
- 7.1.1.11 "Openings which the contractor proposes to fill from within his own organization" means employment openings for which no consideration will be given to persons outside the contractor's organization (including any affiliates, subsidiaries, and the parent companies) and includes any openings which the contractor proposes to fill from regularly established "recall" lists.
- 7.1.1.12 "Openings, which the contractor proposes to fill pursuant to a customary and traditional employer-union, hiring arrangement," means employment openings, which the contractor proposes to fill from union halls, which is part of the customary and traditional hiring relationship, which exists between the contractor and representative of his employees.
- 7.1.1.13 The contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- 7.1.1.14 In the event of the contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- 7.1.1.15 The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the contracting officer. Such notices shall state the contractor's obligation under the law to take affirmative steps to employ and advance in employment qualified disabled veterans and veterans of the Vietnam era for employment, and the rights of applicants and employees.
- 7.1.1.16 The contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or

other contract understanding, that the contractor is bound by the terms of the Vietnam Era Veterans Readjustment Assistance Act, and is committed to take affirmative steps to employ and advance in employment qualified disabled veterans and veterans of the Vietnam Era.

7.1.1.17 The contractor will include the provisions of this clause in every subcontract or purchase order of \$10,000 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to the Act, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance.

8.1 Section 109 of the Housing and Community Development Act of 1974

- 8.1.1 No person in the United States shall on the ground of race, color, national origin, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.
- 8.1.2 Whenever the Secretary of HUD determines that a State or unit of general local government which is a recipient of assistance under this title has failed to comply with subsection 8.1.1 or an applicable regulation, he shall notify the Governor of such State or the chief executive officer of such unit of local government of the noncompliance and shall request the Governor or the chief executive officer to secure compliance. If within a reasonable period of time, not to exceed sixty days, the Governor or the chief executive officer fails or refuses to secure compliance, the Secretary is authorized to (1) refer the matter to the Attorney General with a recommendation that an appropriate civil action be instituted; (2) exercise the powers and functions provided by Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d); (3) exercise the powers and functions provided for in section 111 (a) of this Act; or (4) take such other action as may be provided by law.
- 8.1.3 When a matter is referred to the Attorney General pursuant to above, or whenever he has reason to believe that a State government or unit of general local government is engaged in a pattern or practice in violation of the provisions of this section, the Attorney General may bring a civil action in any appropriate United States court for such relief as may be appropriate, including injunctive relief.

9.1 **Civil Rights Act of 1964**

9.1.1 Under Title VI of the Civil Rights Act of 1964, no person shall, on the grounds of race, color, sex, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving Federal financial assistance. Subsequent civil rights legislation has extended nondiscrimination to classes based on age and handicap.

10.1 **Certification of Compliance with Air and Water Acts**

(Applicable to Federally-assisted construction contracts and related subcontracts exceeding \$100,000)

10.1.1 During the performance of this contract, the contractor and all subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42, USC 1857 et seq., the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR 15, as amended.

10.1.2 In addition to the foregoing requirements, all nonexempt contractors and subcontractors shall furnish to the owner, the following:

A stipulation by the contractor or subcontractors, that any facility to be utilized in the performance of any nonexempt contract or subcontract, is not listed on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20.

Agreement by the contractor to comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 USC 1857 c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 USC 1318) relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued thereunder.

A stipulation that as a condition of contract award, prompt notice will be given of any notice received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized, or to be utilized for the contract, is under consideration to be listed on the EPA List of Violating Facilities.

Agreement by the contractor that he will include, or cause to be included, the criteria and requirements in 10.1.2.1 to 10.1.2.4 of this section in every subcontract and requiring that the contractor take enforcement action as the Government

11.1 Hazards, Safety Standards and Accident Prevention

11.1.2 Use of Explosives

11.1.2.1 When the use of explosives is necessary for the prosecution of the work, the contractor shall observe all local, State and Federal laws in purchasing and handling explosives and take all necessary precaution to protect completed work, neighboring property, waterlines, or other underground structures. Where there is danger to structures or property from blasting, the charges shall be reduced and the material covered with suitable timber, steel or rope mats. The contractor shall notify all owners of public utility property of intention to use explosives at least 8 hours before blasting is done, close to such property.

11.1.3 Danger Signals and Safety Devices (Modify as Required)

11.1.3.1 The contractor shall take all necessary precautions to guard against damages to property and injury to persons. He shall put up and maintain in good condition, sufficient red or warning lights at night, suitable barricades and other devices necessary to protect the public. In case the contractor fails or neglects to take such precautions, the Owner may have such lights and barricades installed and charge the cost of this work to the contractor. Such action by the Owner does not relieve the contractor of any liability incurred under these specifications or contract.

12.1 Or Equal Clause

Whenever a material, article or piece of equipment is identified on the plans or specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and any material, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, meets State plumbing requirements as equal in substance or structure.

FEDERAL LABOR STANDARDS PROVISIONS

U.S. Department of Housing and Urban Development
Office of Labor Relations Previous editions are obsolete
Form **HUD-4010** (06/2009) ref. Handbook 1344.1

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section I(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

- (1)** The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2)** The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part Previous editions are obsolete Page 2 of 5 form **HUD-4010** (06/2009) ref. Handbook 1344.1

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted

under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes

any statement knowing the same to be false..... shall be fined not more than \$5,000 or imprisoned not more than two years, or both.”

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds \$100,000. As used in this paragraph, the terms “laborers” and “mechanics” include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in sub paragraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds \$100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

Attachment 1R
Bid Package for ACEDP Funded Projects
Enumeration of Plans, Specifications and Addenda

Following are the Plans, Specifications and Addenda which form a part of this contract, as set forth in the General Conditions, "Contract and Contract Documents":

Plans/Drawings

- 1.0 COVER SHEET
- a1.0 ARCHITECTURAL SITE PLAN
- a1.1 FLOOR PLAN
- a1.2 ROOF PLAN, RCP & PLAN DETAILS
- a2.1 EXTERIOR ELEVATIONS & BUILDING SECTIONS
- a3.1 BUILDING SECTIONS & WALL SECTION
- a4.1 WALL SECTIONS
- a5.1 STOREFRONT & INTERIOR ELEVATIONS
- s1.1 FOUNDATION PLAN, DETAILS & NOTES
- s2.1 FRAMING PLAN & DETAILS
- p1.1 PLUMBING DRAIN PLAN, DETAILS & NOTES
- p1.2 PLUMBING SUPPLY PLAN & SCHEDULES
- m1.1 MECHANICAL PLAN & NOTES
- m1.2 MECHANICAL SCHEDULES
- e1.1 ELECTRICAL POWER PLAN, NOTES & SCHEDULES
- e1.2 ELECTRICAL LIGHTING PLAN, NOTES & SCHEDULES

SPECIFICATIONS

- A. Advertisement for Bids
- B. Instruction to Bidders
- C. N/A
- D. Bid for Lump Sum Contract
- E. Certification of Bidder Regarding Equal Employment Opportunity
- F. Contractor Section 3 Certification
- G. Estimated Project Workforce Breakdown
- H. Contract and General Conditions
- I. Bonding and Insurance Requirements
- J. Bid Bond
- K. Arkansas Statutory Payment and Performance Bond
- L. Certificate of Owner's Attorney
- M. General Conditions of the Contract
- N. Supplemental Conditions of the Contract
- O. Wage Determination Preface Sheet
- P. Architect's Certification of Compliance with Minimum Standards for Access by Handicapped
- Q. Regulatory Requirements
- R. Enumeration of Plans, Specifications and Addenda
- S. Technical Specifications of the Contract
- T. ACEDP Project Sign Specification
- U. Arkansas Energy Code (Form 121 and 122)
- V. Disclosure Required by Executive Order 98004 (Form 123)

Division 1 – General Data

- 01010 Summary of Work
- 01045 Cutting and Patching
- 01300 Submittals
- 01310 Construction Schedules
- 01410 Testing Laboratory Services
- 01500 Temporary Facilities
- 01640 Substitutions
- 01710 Cleaning
- 01730 Operation and Maintenance Data
- 01740 Warranties and Bonds

Division 2 – Site Construction

- 02100 Demolition and Site Preparation
- 02200 Earthwork
- 02245 Finish Grading
- 02500 Site Drainage
- 02520 Portland Cement Concrete Paving

Division 3 – Concrete

- 03131 Soil Treatment
- 03301 Cast-In-Place Concrete

03351 Colored Concrete Finishing

Division 4 – Masonry N/A

Division 5 – Metals N/A

Division 6 – Wood and Plastics

06100 Rough Carpentry
06191 Preformed Wood Trusses
06200 Finish Carpentry
06402 Architectural Woodwork

Division 7 – Thermal and Moisture Protection

07201 Building Insulation
07421 Metal Wall and Roof Panels
07600 Flashing and Sheet Metal
07901 Joint Sealants

Division 8 – Doors and Windows

08110 Steel doors and Frames
08211 Flush Wood Doors
08410 Aluminum Entrances and Storefronts
08710 Finish Hardware
08800 Glass and Glazing

Division 9 – Finishes

09250 Gypsum Drywall
09900 Painting

Division 10 – Specialties

10155 Toilet Compartments
10400 Identifying Devices
10425 Signs
10520 Fire Extinguishers and Accessories
10800 Toilet and Bath Accessories

Division 11 – N/A

Division 12 – N/A

Division 13 – N/A

Division 14 – N/A

Division 15 – N/A

Division 16 – N/A

Division 17 – N/A

Division 18 – N/A

Division 19 – N/A

Division 20 – N/A

Division 21 – N/A

Division 22 – Plumbing

22 11 16	DOMESTIC WATER PIPING
22 13 16	SANITARY WASTE AND VENT PIPING
22 33 30	ELECTRIC WATER HEATERS
22 40 00	PLUMBING FIXTURES

Division 23 – Mechanical

23 01 00	General Mechanical Requirements
23 07 00	Mechanical Insulation
23 11 13	Natural Gas Piping System
23 30 00	Air Distribution
23 34 00	Fans
23 61 00	Gas Fired Furnaces
23 62 00	Air Cooled Condensing Units- Under 20 Tons
23 81 31	Ductless Split Systems

Division 26 – Electrical

26 01 00	General Electrical Requirements
26 05 13	Medium Voltage Cables
26 05 26	Grounding
26 05 31	Raceways
26 05 32	Wires And Cables
26 05 33	Boxes And Enclosures
26 05 34	Wiring Devices
26 05 51	Supporting Devices
26 05 53	Electrical Identification
26 18 13	Disconnect Switches
26 24 13	Circuit Breaker Distribution Panels
26 24 16	Circuit Breaker Lighting Panelboards 240 Vac Max
26 50 00	Lighting

Division 27 – N/A

STATED ALLOWANCES

Pursuant to the General Conditions, the contractor shall include the following cash allowances in his proposal:

Not applicable

Special Hazards

The Contractor's and his Subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards:

Contractor's and Subcontractor's Public Liability, Vehicle Liability and Property Damage Insurance

As required in the General conditions, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than \$ 500,000.00 for injuries, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than \$ 500,000.00 on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$ 500,000.00.

The Contractor shall either require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage of the type and in the same amounts as specified in the preceding paragraph, or insure the activities of his subcontractors in his own policy.

Photographs of Project

As provided in the General Conditions, the Contractor will furnish photographs in the number, type, and stage as enumerated below:

Schedule of Occupational Classifications and Minimum Hourly Wage Rates as Required in the General Conditions

Builder's Risk Insurance

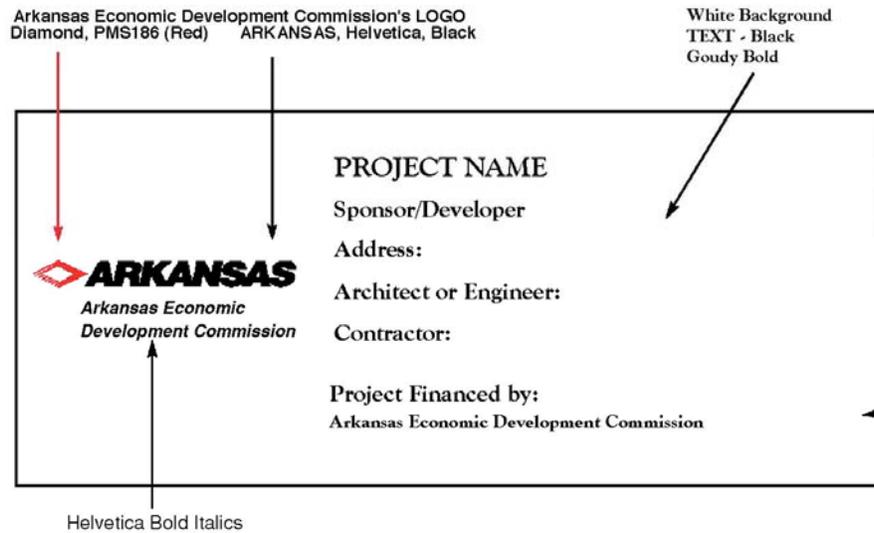
As provided in Bonds and Certificates, the Contractor will maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portions of the project for the benefit of the Owner, the Contractor, and all subcontractors, as their interests may appear.

Attachment 1S
Bid Package for ACEDP Funded Projects
Technical Specifications of the Contract

Any technical specification of the contract, so desired by the Owner, in addition to the preceding specified contract documents shall be entered below.

Attachment 1T
Sample Bid Package For ACEDP Funded Projects

Attachment 1T
Sample Bid Package For ACEDP Funded Projects
ACEDP Project Sign Specifications



SIGN DIMENSIONS: Approximately 4' x 8' x 3/4" * PLYWOOD PANEL (APA Rated A-B grade exterior)

Construction Management-83
(1999)

Form 121
Attachment 1U
Certificate of Compliance for the 2004 Arkansas Energy Code
Design Professional

I, the undersigned, Greg Anderson, the duly authorized licensed design professional of record for the Manila Senior Center located at Airport Road, Manila, Arkansas, certify that the aforementioned building is designed to meet and or exceed the minimum requirements of the 2004 Arkansas Energy Code * and building specifications, based on the requirements, have been provided to me by the licensed design professional(s) of record.



Digitally signed by Greg Anderson
Date: 2017.03.29 15:56:57-05'00'

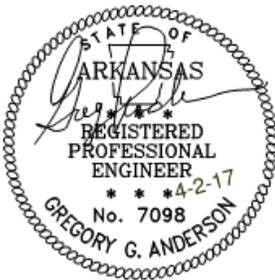
Signature

7098

License Number

March 29, 2017

Date



Stamp

Per legislative authority provided by in Section 3(B)(2)(c) of Act 7 of 1981

For information regarding the specifications and requirements of the 2004 Arkansas Energy Code, contact the Arkansas Energy Office at 1-800-558-2633 or find related materials and resources at www.arkansasenergy.org .

Form 122

Attachment V
DISCLOSURE REQUIRED BY EXECUTIVE ORDER 98-04

Contracts and Grants

Any contract or amendment to a contract or any grant executed by an agency which exceeds \$25,000 shall require the contractor to disclose information as required under the terms of Executive Order 98-04 and the Regulations pursuant thereto.

Any individual contracting with the State of Arkansas shall disclose if he or she is a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or the spouse or immediate family of any of the persons as described herein.

Any entity contracting with the State of Arkansas shall disclose

- (a) any position of control, or
- (b) any ownership interest of 10% or greater

that is held by a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or the spouse or immediate family of any of the persons as described herein.

Disclosure by Sub-contractor or Assignee

Any sub-contractor or assignee (hereinafter "Third Party") shall disclose whether such Third Party is a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or the spouse or immediate family member of any of the persons as described herein, or if any of the persons here described in this sentence hold any position of control or ownership interest of 10% or greater in the Third Party. This disclosure requirement shall apply during the entire term of the contract or grant, without regard to whether the subcontract or assignment is entered into prior or subsequent to the date of contract or grant.

Failure to Disclose and Violations

The failure of any person or entity to disclose as required under any term of Executive Order 98-04, or the violation of any rule, regulation or policy promulgated by the Department of Finance and Administration pursuant to this Order, shall be considered a material breach of the terms of the contract or grant and shall subject the party failing to disclose or in violation to all legal remedies available to the state agency under the provision of existing law.

Please check all that apply if you are a current or former:

_____ Member of the General Assembly of the State of Arkansas

_____ Constitutional Officer of the State of Arkansas

_____ Member of a Board or Commission of the State of Arkansas

_____ State Employee

_____ Spouse of a current or former member of the general assembly, constitutional officer, board or commission member, or state employee.

_____ I am a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or spouse or immediate member of these persons as described, and I hold a position of control in the contracting entity or grantee of this application.

_____ I am a current or former: member of the general assembly, constitutional officer, board or commission member, state employee, or spouse or immediate member of these persons as described, and I hold a 10% or higher interest in the contracting entity or grantee of this application.

I hereby acknowledge that failure to disclose the information as required by Executive Order 98-04 shall constitute a material breach of any future agreement, resulting from this application, with the State of Arkansas or any state agency acting on its behalf.

I also acknowledge that any individual drawing a salary or performing personal services for an agency must disclose any direct or indirect benefit he or she may receive as a result of any State contract with an entity in which he or she has a financial interest. I understand that failure to report this information may subject me to criminal sanctions, as provided in Ark. Code Ann. §19-11-702.

Name

Date

**SECTION 01010
SUMMARY OF WORK**

PART 1 GENERAL

1.1 PROJECT DESCRIPTION

- A. The scope of work consists of the construction of a new 4,090 SF Senior Center for the City of Manila, Arkansas, located on Airport Road.
1. Spaces include a community room, offices, a lounge and exercise room, restrooms, a warming kitchen with a pantry and dishwash room, and a mechanical room. Work is to include site preparation and grading, pouring of concrete foundations and slab.

The structure consists of wood stud walls and supporting members, pre-fabricated wood roof trusses with wood decking and standing seam metal roofing.

Exterior finishes include tongue and groove cypress siding, pre-finished standing seam metal panels and roof, aluminum storefront windows and doors. Interior finishes include stained and sealed concrete floors, painted gypsum board walls and ceilings, and built in countertops.

1.2 CONTRACTOR USE OF PREMISES

- A. General: During the construction period the Contractor shall have controlled and coordinated use of the facilities as agreed upon by the Owner. The Contractor's use of the site shall be limited and coordinated with the Owner.

1.3 OWNER OCCUPANCY

- A. Partial Owner Occupancy: The Owner shall occupy portions of the work by Substantial Completion provided that such occupancy does not interfere with completion of the Work. Such occupancy shall not constitute acceptance of the total Work.
1. A Certificate of Substantial Completion will be executed for each specific portion of the Work to be occupied prior to Owner occupancy.
2. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy the Owner will provide operation and maintenance of mechanical and electrical systems in occupied portions of the building.

PART 2 PRODUCTS (Not applicable).

PART 3 EXECUTION

3.1 RESPONSIBILITY

- A. The General Contractor is responsible for scheduling and coordination of orderly work, the proper supply of manpower, equipment and supplies, the safety conditions of the Project and the compliance with all safety and health regulations and codes.

END OF SECTION 01010

**SECTION 01045
CUTTING AND PATCHING**

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Related Requirements Specified elsewhere:
 - 1. Summary of Work
 - 2. Excavation and Backfilling
 - 3. Mechanical
 - 4. Electrical

- B. Execute cutting (including excavating), fitting or patching of Work, as required to:
 - 1. Make several parts fit properly.
 - 2. Uncover Work to provide for installation of ill-timed Work.
 - 3. Remove and replace defective Work.
 - 4. Remove and replace Work not conforming to requirements of Contract Documents.
 - 5. Remove samples of installed Work as specified for testing.

- C. In addition to contract requirements, upon written instructions of Owner's Representative:
 - 1. Uncover Work to provide for observation of covered Work.
 - 2. Remove samples of installed material for testing.

- D. Do not endanger any Work by cutting or altering Work or any part of it.

- E. Do not cut or alter Work of another Contractor without written consent of Owner's Representative.

1.2 SUBMITTALS

- A. Prior to cutting which affects structural safety of Project, or Work of another contractor, submit written notice to Owner's Representative, requesting consent to proceed with cutting, including:
 - 1. Identification of Project.
 - 2. Description of affected Work.
 - 3. Necessity for cutting.
 - 4. Affect on other Work, on structural integrity of Project.
 - 5. Description of proposed Work. Designate:
 - a. Scope of cutting and patching.
 - b. Contractor and trades to execute Work.
 - c. Products proposed to be used.
 - d. Extent of refinishing.
 - 6. Alternatives to cutting and patching.
 - 7. Designation of party responsible for cost of cutting patching.

- B. Prior to cutting and patching done on instructions of Architect, submit cost estimate.

- C. Should conditions of Work, or schedule, indicate change of materials or methods, submit written recommendation to Architect, including:
 - 1. Conditions indicating change.
 - 2. Recommendations for alternative materials or methods.
 - 3. Submittals as required for Substitutions.

- D. Submit written notice to Owner's Representative designating the time that the work will be uncovered, to provide for observation.

PART 2 – MATERIALS

2.1 PRODUCTS

For replacement of Work removed, comply with specifications for type of Work to be done.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Inspect existing conditions of Work, including elements subject to movement or damage during cutting and patching or excavating and backfilling.
- B. After uncovering Work, inspect conditions affecting installation of new product.

3.2 PERPARATION PRIOR TO CUTTING

- A. Provide shoring, bracing and support as required to maintain structural integrity.
- B. Provide protection for other portions of Project.
- C. Provide protection from elements.

3.3 PERFORMANCE

- A. Execute fitting and adjustment of products to provide finished installation to comply with the specified tolerance, finishes.
- B. Execute cutting and demolition by methods that will prevent damage to other Work, and will provide proper surfaces to receive installation of repairs and new Work.
- C. Restore Work that has been cut or removed; install new product to provide completed Work in accord with requirements of contract Documents.
- D. Refinish surfaces as necessary to provide an even finish.
 - 1. Continuous Surfaces: refinish to nearest intersections.
 - 2. Assembly: refinish entire assembly.

END OF SECTION 01045

**SECTION 01340
SUBMITTALS**

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Submit to the Owner's Representative, shop drawings, project data and samples required by Specification sections.
- B. Prepare and submit with construction Schedule, upon request, a separate schedule listing dates for submission and dates reviewed shop drawings, project data and samples will be needed for each product.

1.2 SUBMITTAL PROCEDURES

- A. Transmit each submittal with a transmittal letter noting project name, project number, submittal number, specification section, Contractors name and signature, Architect name, Owner name.
- B. Sequentially number the transmittal forms. Resubmittals to have original number with a numeric suffix separated by a dash.
- C. Identify Project, Contractor, Subcontractor, or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
- D. Affix Contractor's stamp, signed or initialed and dated to each drawing sheet, product booklet and sample transmittal sheet, certifying that review, verification of Products required, field dimensions, quantities, adjacent construction Work, and coordination of information are in accordance with the requirements of the Work and Contract Documents.

1.3 SHOP DRAWINGS:

Submit a minimum of five (5) prints of each drawing, including fabrication, erection, lay out and setting drawings, and other such drawings as required under various sections of the Specifications until final approval is obtained. Shop drawings shall be dated and marked to show the name of the Project, Architect, Contractor, originating subcontractor, Manufacturer or Supplier, and separate details as pertinent. Shop drawings shall completely identify locations at which materials or equipment are to be installed. REPRODUCTION OF ARCHITECT'S DRAWINGS WILL NOT BE ALLOWED FOR SHOP DRAWINGS.

1.4 PROJECT DATA:

Submit sufficient copies of manufacturer's descriptive data including catalog sheets for materials, equipment and fixtures, showing dimensions, performance characteristics and capacities, wiring diagram and controls, schedule, and other pertinent information as required. Brochure and other submittal data that cannot be reproduced economically shall be submitted in such quantities as to allow the Owner's Representative to retain three (3) copies of each after review. Project data shall be marked to show the name of the Project, Architect, Contractor, originating subcontractor, manufacturer or supplier, and separate details if pertinent. Product data shall completely identify locations at which materials or equipment are to be installed. Clearly mark to show pertinent data applicable to the project.

1.5 SAMPLES:

Submit physical examples of materials when required by Specification sections to illustrate materials, workmanship, or to establish standards by which completed work shall be judged. Samples shall be dated and marked to show the name of the Project, Architect, General Contractor, originating subcontractor, manufacturer or supplier, and separate details if pertinent. Samples shall completely identify location at which materials or equipment are to be installed.

1.6 CONTRACTOR RESPONSIBILITIES:

Contractor shall review shop drawings, project data and samples prior to submission to Owner's Representative. It shall include contractor's stamp (initialed or signed) certifying his review of submittal, verification of field dimensions and compliance with Contract Documents. Shop drawings, project data and samples not so stamped, checked and approved by the contractor will not be reviewed by the Owner's Representative, but will be returned to the contractor. Shop drawings stamped and signed as approved by the General Contractor, but showing evidence that they have not been carefully checked by the Contractor will be returned to the contractor. The Contractor shall then recheck and resubmit to the Owner's Representative for approval.

- A. Contractor's responsibility for errors and omissions in submittals is not relieved by Owner's Representative's review of submittals,
- B. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Owner's Representative's review of submittals, unless Owner's Representative gives written acceptance of specific deviations.
- C. At time of submission, notify Owner's Representative in writing of any deviations in submittals from requirements of Contract Documents.
- D. Begin no work that requires submittals until return of approved submittals with Owner's Representative's stamp and initials or signature indicating review. Resubmit as required for approval.
- E. After Owner's Representative's review, distribute copies as required.

1.7 SUBMISSION REQUIREMENTS:

- A. Schedule submissions at least 10 working days before dates reviewed submittals will be needed including considerations for ordering, transportation, and installation.
- B. Accompany submittals with transmittal letter, containing the date, project title and number, Contractor's name and address, number of each shop drawing, project data and samples submitted, and notification of deviations from Contract Documents.

1.8 RESUBMISSION REQUIREMENTS:

- A. Shop Drawings: Revise initial drawings as required and resubmit as specified for initial submittal. Indicate on drawings any changes that have been made other than those required by Owner's Representative.
- B. Project Data and Samples: Submit new data and samples as required for initial submittal.

1.9 OWNER'S REPRESENTATIVE'S DUTIES:

- A. If requested by the Owner, the Owner's Representative will review Shop Drawings, Project Data and Samples; he will do so with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Owner's Representative's approval of a separate item shall not indicate approval of an assembly in which the item functions.
- B. The Owner's Representative's approval of Shop Drawings, Project Data and Samples shall not relieve the Contractor of responsibility of any deviation from the Contract Documents unless the Contractor has informed the Owner's Representative in writing of each deviation at the time of submission and the Owner's Representative has given approval to the specific deviation, nor shall the Owner's Representative's approval relieve the Contractor from responsibility for errors or omissions in the Shop Drawings, Project Data and Samples.

1.9 DISTRIBUTION OF SHOP DRAWINGS AND SUBMITTALS:

Contractor is responsible for obtaining and distributing prints of shop drawings as necessary after as well as before final approval. The costs of printing ALL shop drawings and submittals are the responsibility of the Contractor.

END OF SECTION 01340

**SECTION 01310
CONSTRUCTION SCHEDULES**

PART 1 – GENERAL

1.1 DESCRIPTION

Provide projected construction schedules for entire Work, revise monthly.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Shop Drawings, Product Data and Samples – Section 01340.

1.3 FORM OF SCHEDULES

- A. Prepare in horizontal bar chart form.
 - 1. Separate bar for each trade or operation.
 - 2. Identify first workday of each week.
 - 3. Identify milestones over life of project.
- B. Prepare in chronological order of start of each item of work.

1.4 CONTENT OF SCHEDULES

- A. Provide complete sequence of construction activity. Indicate dates for beginning and completion of each activity.
- B. Submittal schedule for Shop Drawings, Product Data and Samples as specified in Section 01340.
- C. Products delivery schedule. Indicate delivery dates for:
 - 1. Products specified by allowances, if any.
 - 2. Owner-furnished products, if any.
- D. Identify work for separate phases or other logically grouped activities.
- E. Include calendar days from date of start of project to date of completion.

1.5 UPDATING

- A. Indicate progress of each activity, including completion dates.
- B. Indicate changes occurring since previous submission of updated schedule:
 - 1. Major changes in scope.
 - 2. Activities modified since previous updating.
 - 3. Revised projections due to changes, progress or completion.
 - 4. Other identifiable changes.

1.6 SUBMITTALS

- A. Submit monthly revised schedules accurately depicting progress to first day of each month.
- B. Submit number of copies required by Contractor, plus 2 copies to be retained by Architect.

END OF SECTION 01310

**SECTION 01410
TESTING LABORATORY SERVICES**

PART 1 – GENERAL

1.1 SCOPE

- A. An Independent Testing laboratory, approved by the Owner's Representative and paid by the Contractor, will perform the professional testing and laboratory services.
- B. Materials and workmanship not meeting the required standards or performance obligations are to be removed and replaced at the contractor's expense, including subsequent testing.
- C. All inspections and tests will be made in accordance with the rules and regulations of the building code and all jurisdictional authorities of the Local Authorities and the State of Arkansas, the specifications of the ASTM and other respective technical societies, organizations or bodies having relation to the Work or materials inspected or tested.
- D. Where the terms "Inspector" and "Testing Laboratory" are used, they mean and refer respectively to an officially designated and accredited inspector of the designated testing laboratory.

1.2 WORK INCLUDED

- A. Tests on Earthwork, Soil Stabilization (if any) and Concrete Paving (if required).
- B. Supervising the mixing of concrete at the site.
- C. Making slump tests of all concrete.
- D. Preparing test cylinders for all concrete.
- E. Compression testing of all specimen cylinders taken from all concrete actually placed throughout the work.
- F. Field tests of mortar and grout.
- G. Inspection and testing of all structural steel as specified herein.
- H. Maintenance of inspection and testing logs of all inspections and tests of structural steel and concrete.
- I. Submittals to Contractor and Owner's Representative certifications, records, and reports of all inspections and tests.

1.3 RELATED WORK

- A. The manufacturer will provide chemical and physical analyses of reinforcing steel and structural steel.
- B. The design of concrete mixes will be provided and paid for by the General Contractor.

1.4 RESPONSIBILITY AND DUTIES OF CONTRACTOR

- A. Deliver to the Laboratory, without cost to Owner, adequate quantities of representative samples of materials proposed for uses that are required to be tested.
- B. Advise Laboratory sufficiently in advance of construction operations to allow Laboratory to complete any required check-tests and assign personnel for field inspection and testing as specified.
- C. Provide adequate facilities for safe storage and proper curing of concrete test samples on project site for the first 24 hours and also for subsequent field curing as required by ASTM Specifications C31.
- D. Furnish such nominal labor as is required to assist Laboratory personnel in obtaining and handling samples at the site.

1.5 AUTHORITY AND DUTIES OF LABORATORY PERSONNEL

- A. Laboratory personnel shall inspect and/or test materials, assemblies, specimens and Work performed including design mixes, methods and techniques as specified, and report to the Owner's Representative the progress thereof.
- B. If the material furnished and/or Work performed fails to meet requirements of Contract Documents, inspector shall promptly notify both the Contractor and the Owner's Representative of such failures.
- C. The inspector is not authorized to revoke, alter, relax, enlarge or release any requirement of the Drawings and Specifications, or to approve or accept any portion of the Work.

1.6 SUBMITTALS AND CERTIFICATION

- A. The inspector shall submit one (1) copy each to the Contractor and Owner's Representative certification of each and every inspection and test required to be made as part of the Work of the Section, or ordered by the Owner's Representative or the General Contractor to be made either in addition to or supplementary to inspecting and testing specified herein or in other Sections of the Specifications.
- B. The inspector shall state in certificates all details of each inspection and test to indicate satisfactory compliance with requirements of the Drawings and Specifications. Also state in certificates any and all unsatisfactory conditions or failure to comply with requirements of the Drawings and Specifications. The requirement is in addition to reporting immediately to the Owner's Representative and all items of unsatisfactory conditions and failures to comply with the requirements of the Drawings and Specifications.
- C. Make above-specified certification regularly, not less frequently than bi-weekly during relevant portions of the Work, and more often if progress of the Work warrants more frequent inspecting and testing.
- D. At completion of each trade or branch of work requiring inspecting and testing, submit a final certificate attesting to satisfactory completion of Work inspected and full compliance with requirements for all Work and materials tested.

PART 2 – MATERIALS

Not applicable.

PART 3 – EXECUTION

3.1 TESTING OF EARTHWORK

- A. Testing laboratory shall perform the forgoing test on fill areas (if required).
 - 1. Plasticity index on fill material prior to use to determine compliance with specified materials.
 - 2. One density test for each 300 square feet of area per lift in place.
 - 3. One Standard Proctor for each type of fill material or on site material when allowed for use as fill.

- B. Testing laboratory approved shall perform the following tests on stabilized grades (if required).
 - 1. Establish moisture density relationship (ASTM D698-66t) for each type of soil.
 - 2. Make Field In-Place Density Test (ASTM D2167-66) for each 5,000 sq. ft. of area per lift.
 - 3. Laboratory shall make on-site visual inspection of lime placements to conform the type and amount of lime used.

3.2 TESTING OF CONCRTE PAVING, CURBS, GUTTERS AND WALKS

- A. The testing laboratory shall perform the following tests:
 - 1. Concrete Compressive Strength on Cylinders at 7 and 28 days.
 - 2. Concrete Slump Determination

- B. All inspection, cylinder requirements, and testing shall be in accordance with testing specified for concrete.

3.3 DESIGN OF CONCRETE MIXES FOR STRUCTURAL CONCRETE

- A. See Structural Drawings for locations for various strengths or concrete.

- B. Design of concrete Mixes:
 - 1. Contractor shall be responsible for and pay for design of concrete mixes. Refer to Section 03300 for procedures.
 - 2. Mix designs shall be checked and revised if necessary wherever changes are made in aggregates or in surface water content of aggregate or workability of the concrete. Slump will be the minimum to produce a workable mix. Laboratory will prescribe maximum quantity of water to be used for each class of concrete.

3.4 CONTROL AND TESTING OF CONCRETE (INSPECTOR'S RESPONSIBILITIES)

- A. During the progress of mixing and placing concrete on job, take specimens, and provide molds as specified, Transport, cure and store cylinders in accordance with the Standard Method for Making and Curing Concrete Compression and Flexure Test Specimens in the Field, ASTM specifications C-31-66. Perform compression tests of 2 specimens after 7 days and 2 after 28 days.

- B. Conduct compression tests of concrete in accordance with ASTM Specifications, Designation C-39-66.

- C. See Structural Drawings for locations for various strengths of concrete.

- D. Test Cylinders: During progress of Work test cylinders shall be made and tested for each different mix placed in any one day. For every concrete placement of 50 cubic yards or part thereof over 10 cubic yards, for compression test cylinders will be made by Testing Laboratory of samples taken during pour.
- E. Slump Tests:
 - 1. Make slump tests for each set of cylinders in accordance with ASTM Designation C-143-66.
 - 2. Slump shall conform to limits shown on Drawings.
- F. Job site inspection of each batch of concrete, adjusting amounts of mixing water to assure uniform consistency for truck to truck.
- G. Check mixing time of concrete in trucks.
- H. Laboratory technicians shall inspect materials and manufacturers of concrete, and report findings. When it appears that material furnished, or Work performed by contractor, fails to fulfill Specification requirements technician shall direct attention of Owner's Representative and Contractor to such failure.
- I. Laboratory technicians do not act as foremen or perform other duties for the contractor. Work will be checked as it progresses, but failure to detect any defective Work or materials shall not, in any way, prevent later rejection when such defect is discovered. Laboratory technicians are not authorized to revoke, alter, relax, enlarge, or release any requirement of the Specifications, nor to approve or accept any portion of Work.
- J. Test reports shall show time test was made, truck ticket number, slump and time of batching and location of each placement.
- K. When strength of test cylinders falls below design strength and Owner's Representative requires drilling of concrete core specimens, test core specimens in accordance with ASTM Specifications, Designation C42-64.
- L. Report promptly to Owner's Representative all details of reasons for rejection of any and all quantities of concrete. Give all information concerning locations of the concrete placement, quantities, date of placement and other pertinent facts concerning concrete represented by the specimens.

3.5 INSPECTION AND TESTING OF MORTAR AND GROUT

The Inspector shall perform tests in accordance with ASTM C-109, one set of three for the first three days of masonry work and one set of three per week thereafter. All samples shall be taken in the field.

3.6 INSPECTION OF STRUCTURAL STEEL (INSPECTOR'S RESPONSIBILITIES)

- A. Inspect all structural steel during fabrication and during and after erection for Conformance with Contract Drawings and Shop Drawings. Any cases of insufficient bracing or guying, or other unsafe conditions shall be immediately called to attention of Contractor and reported to Owner's Representative.

- B. Visually inspect and check for size and appearance. When directed by Owner's Representative, visual inspection shall be supplemented by other means of testing, such as radiographic, ultrasonic, etc.
- C. No burning or other field corrections are permitted without express permission of the Owner's Representative. Immediately report any violation to Owner's Representative.

3.7 QUALIFICATIONS OF WELDERS

Fabricator and erector shall provide the Testing Laboratory with names of welders to be employed on Work, together with certification that each of these welders has passed qualification tests within last year using procedures covered in the American Welding Society Standard D1.0-63.

END OF SECTION 01410

**SECTION 01500
TEMPORARY FACILITIES AND CONROLS**

PART 1 – GENERAL

1.1 TEMPORARY WATER

All water required in the performance of the Contract shall be provided and paid for by the Owner.

1.2 TEMPORARY ELECTRICITY

Temporary electric service required in the performance of the Contract shall be furnished and paid for by the Owner.

1.3 TEMPORARY HEAT

Temporary heat, fuel and service as necessary to protect all work and materials against injury from dampness and cold shall be furnished and paid for by the Owner. In addition, provide temporary heat as follows:

- A. During placing, setting and curing of concrete provide sufficient heat to ensure heating of spaces involved to not less than 50 degrees F.
- B. From beginning of application of plaster and during setting and curing period, sufficient heat to produce temperature of not less than 50 degrees F.
- C. During all phases of interior finishes work, and until final acceptance of occupancy by Owner, provide sufficient heat to produce a temperature of not less than 70 degrees F.
- D. Before Substantial Completion, all registers, diffusers and filters shall be cleaned or replaced as appropriate.

1.4 TEMPORARY SANITARY FACILITIES

Provide suitable temporary toilet facilities complying with all building and sanitation ordinances, laws and codes. Remove all temporary sanitary facilities before Final Inspection.

1.5 UTILITIES FOR TESTING

Any water, gas or electricity required for testing of installed equipment installed under this Contract shall be the responsibility of this Owner unless specified differently in specific sections.

1.7 PROTECTION FOR WORK IN PLACE

Work in place that is subject to injury because of operations carried on adjacent thereto shall be covered or substantially enclosed with adequate protection. Permanent openings used as thoroughfares for the introduction of work or material to the structure shall have heads, jambs, and sills well blocked and boarded. All forms of protection shall be constructed in a manner that, upon completion, the entire Work will be delivered to the Owner in proper, whole and unblemished condition. Work that is not delivered to the Owner in said condition shall be repaired or replaced by the Contractor at the Contractors expense.

1.8 TEMPORARY FIRE PROTECTION

The Contractor shall provide and maintain fire extinguishers, fire hoses and other equipment as necessary for proper fire protection during construction. Such equipment is to be used for fire protection only.

1.9 PUMPING AND DRAINAGE

Surface or subsurface water or other fluids shall not be permitted to accumulate in excavations of in or about the premises and vicinity. Water or other fluid shall be controlled and suitably disposed of by means of temporary pumps, piping drainage lines of other methods approved by Owner's Representative.

1.10 TEMPORARY BUILDINGS

All temporary buildings shall be weather and watertight and maintained in a neat, orderly appearance for the duration of the Work.

- A. Enclosed Storage Areas: Contractor and each sub-contractor, for their own use, shall provide and maintain watertight storage sheds for materials that might be damaged by weather. Floors should be raised above ground level. Remove from site at completion of Work.
- B. Temporary Public Protection: Should Government, State or local authorities required construction of temporary barricades or covered passageways they shall be constructed by the Contractor at no additional cost to the Owner, shall be as approved by the Owner's Representative and shall be painted and maintained in an orderly, neat appearance at all times and be repainted when necessary and as directed by the Owner's Representative.
- C. Removal of Temporary Construction; Temporary office facilities, toilets, storage sheds, and other construction of temporary nature shall be removed from the site as soon as the progress of the Work will permit; and the portions of the site occupied by same shall be properly reconditioned and restored to a condition acceptable to the Owner's Representative.

1.11 PROTECTION AND WARNING

Provide and erect all temporary planking, bridges, fences, bracing, shoring, needle pinning, and warning signs and lights required by jurisdictional authorities and/or site conditions to protect persons, streets, and adjacent on-site and off-site property. Contractor shall ascertain legal and other requirements.

END OF SECTION 01500

**SECTION 01640
SUBSTITUTIONS**

PART 1 – GENERAL

1.1 PRODUCT LIST

- A. During Bidding Process, Contractor is to submit to Architect a complete list of all products and materials that are proposed for substitution.
- B. Prepare list on the basis of each specification section.
- C. For products specified under reference standards, include with listing of each product or material:
 - 1. Name and address of manufacturer.
 - 2. Trade name
 - 3. Model or catalog designation
 - 4. Manufacturer's data
 - a. Performance and test data
 - b. Reference standard

1.2 CONTRACTOR'S OPTIONS

- A. For products specified only by reference standards, the Contractor may select any product meeting standards by any manufacturer.
- B. Whenever a material, article or piece of equipment is identified on the Drawings or in the specifications by reference to manufacturers' or vendors' names, trade names, catalog numbers, or the like, it is chosen specifically for this Project and substitutions will not be considered.
- C. Whenever a material, article or piece of equipment is identified on the Drawings or in the Specifications by reference to manufacturers' or vendors' names, trade names, catalog numbers, or the like, and is followed by "or equal" or "or approved equal", it is so identified for the purpose of establishing a standard, and any material, article, or piece of equipment of other manufacturers or vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or piece of equipment so proposed is in the opinion of the Owner's Representative, of equal substance, appearance and function. It shall not be purchased or installed by the Contractor without the Owner's Representative's written approval.

1.3 SUBSTITUTIONS

- A. Submittals for substitutions shall be as required for Shop Drawings, Project Data, and Samples in Section 01340 of the Specifications.
- B. In making request for substitution, Contractor represents:
 - 1. He has personally investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.
 - 2. He will provide the same guarantee for substitution as for product or method specified.
 - 3. He will coordinate installation of accepted substitution into Work, making such changes as may be required for work to be complete in all respects.
 - 4. He waives all claims for additional costs and time related to substitution that subsequently becomes apparent.

END OF SECTION 01640

**SECTION 01710
CLEANING**

PART 1 – GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

Cleaning-up required for specific trades or work is specified in section pertaining to that trade or work.

1.2 REQUIREMENTS OF REGULATORY AGENCIES

- A. Fire Protection: Store volatile waste in covered metal containers, and remove from premises daily.
- B. Pollution Control: Conduct clean-up and disposal operations to comply with local ordinances and anti-pollution laws. Burning or burying of rubbish and waste materials on the project site is not permitted. Disposal of volatile fluid wastes (such as mineral spirits, oil or paint thinner) in storm or sanitary sewer systems or into streams or waterways is not permitted.

PART 2 - MATERIALS

2.1 CLEANING MATERIALS

- A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 – EXECUTION

3.1 DURING CONSTRUCTION

- A. Oversee cleaning and ensure that building and grounds are maintained free from accumulations of waste materials and rubbish.
- B. Sprinkle dusty debris with water.
- C. At not less than every 4 work days during progress of work, clean-up site and access and dispose of waste materials, rubbish and debris.
- D. Provide dump containers and locate on site for collection of waste materials, rubbish, and debris.
- E. Do not allow waste materials, rubbish, and debris to accumulate and become an unsightly or hazardous condition.
- F. Remove waste materials, rubbish, and debris from the site and legally dispose of a public or private dumping areas off the owner's property.
- G. Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for acceptance or occupancy.
- H. Lower waste materials in a controlled manner with as few hand-changes as possible; do not drop or throw materials from heights.

- I. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

3.2 FINAL CLEANING

- A. Use experienced workmen, or professional cleaners for final cleaning.
- B. At completion of construction and just prior to acceptance or occupancy conduct a final inspection of exposed interior and exterior surfaces.
- C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from interior and exterior surfaces.
- D. Repair, patch and touch-up marred surfaces to match adjacent finishes.
- E. Broom clean paved surfaces; rake clean other surfaces of grounds.
- F. Replace air conditioning filters if units were operated during construction.
- G. Clean ducts, blowers, and coils if air conditioning units were operated without filters during construction.
- H. Sweep and buff resilient floors and base.
- I. Dust all walls, metal, wood and similar finished materials.
- J. Clean all cabinet and casework.
- K. Dust and wash all plumbing and electrical fixtures.
- L. Wash and buff or polish all non-resilient materials.
- M. Vacuum all floor areas before applying finish or finish material.

END OF SECTION 01710

**SECTION 01730
OPERATION AND MAINTENANCE DATA**

PART 1 – GENERAL

1.1 PRIOR TO FINAL PAYMENT

The responsible Prime Contractors shall provide maintenance information and operations instructions for equipment and systems provided under their Contracts.

1.2 OPERATION MANUALS

Prepare operating and maintenance instructions for all equipment, particularly mechanical and electrical, that will require any adjustment servicing, or attention for its proper operation. These instructions shall set forth all of the information necessary for the Owner to operate and make full and efficient use of equipment, and perform such maintenance and servicing as would ordinarily be done by Owner or his personnel. They shall be written in simple, non-technical language when possible, with sufficient diagrams and explanation where necessary to be readily understandable by average layman. Possible hazards shall be particularly pointed out with instructions cautioning against mistakes in operation that might result in damage or danger to equipment, building or personnel.

1.3 APPROVAL

Three copies of instructions shall be submitted to Owner's Representative for review and approval, one copy of which shall be returned to Contractor approved or with instructions for changes.

1.4 OPERATION MANUAL SERVICE INDEX

Append to manual the name, address, and telephone number of Contractors and Subcontractors. For mechanical items, provide the name, address and telephone number of companies servicing installed equipment on a 24 hour basis.

1.5 OPERATION INSTRUCTION

After submission of the above mentioned written instructions, Contractor shall furnish competent operation engineer or engineers at such time or times as directed by Owner's Representative to meet with Owner, to fully explain instructions and to demonstrate and fully familiarize Owner or his representative with all of equipment and all phases of its operation and maintenance. The amount of time to be devoted to instructions shall be reasonable and consistent with the size of the installation and the complexity thereof. Instructions shall be adequate to the extent that the Owner's personnel may proceed with normal operations in a safe and efficient manner.

1.6 ADDITIONAL INFORMATION

In addition to the above mentioned instructions, Contractor shall furnish to Owner's Representative two (2) copies of literature on all of the mechanical and electrical equipment installed in job. Notations shall be written on literature indicating how particular item was used and its location. This information and literature will be forwarded to Owner by Owner's Representative to aid in future servicing of equipment and ordering replacement item or parts, and it shall be in sufficient detail to satisfactorily serve this purpose.

1.7 FORM OF SUBMITTALS

Prepare Operation Manuals appended with the manual service index in duplicate binders. 8 ½"x 11" in size with punched sheets for three ring binders; fold larger sheets to fit into binders. The cover of the packet shall be clearly identified with a typed or printed title in contrasting color to the binder with the title "Operation Manual". Binders shall be of good quality, three ring, with durable cover.

END OF SECTION 01730

**SECTION 01740
WARRANTIES AND BONDS**

PART 1 – GENERAL

1.1 GENERAL

- A. Compile specified warranties and bonds.
- B. Compile specified service and maintenance contracts.
- C. Co-execute submittals when so specified.
- D. Review submittals to verify compliance with Contract Documents.
- E. Submit to Architect for review and transmittal to Owner.
- F. Related Requirements in General Conditions.
- G. Related Requirements Specified in Other Sections:
 - 1. Warranties and Bonds Required for Specific Products: refer to each respective section of the Specifications as required.
 - 2. Provisions of Warranties and Bonds and Duration: refer to the respective section of Specifications which involves the specified product.

1.2 SUBMITTAL REQUIREMENTS

- A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors.
- B. Number of original signed copied required: two each.
- C. Table of Contents; neatly typed, in orderly sequence. Provide complete information on each item.
 - 1. Product or work item.
 - 2. Firm with name of principal, address and telephone number.
 - 3. Scope.
 - 4. Date of beginning of warranty, bond or service and maintenance contract.
 - 5. Duration of warranty, bond for service maintenance contract.
 - 6. Provide information for Owner's personnel of the following:
 - a. Proper procedures in case of failure.
 - b. Instances which might affect the validity of warranty or bond.
 - 7. Contractor with name of responsible principal, address and telephone number.

1.3 FORM OF SUBMITTALS

- A. Prepare duplicate binders.
- B. Format:
 - 1. Size: 8-1/2" x 11" punched sheets for three ring binders; fold larger sheets to fit into binders.
 - 2. Cover: Identify each packet with typed or printed title "Warranties & Bonds"; list:
 - a. Title of Project

b. Name of Contractor

C. Binders shall be good quality, three ring, with durable cover.

1.4 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service during progress of construction, submit documents within ten days after inspection and acceptance.

B. Otherwise, make submittals within ten days after Date of Substantial Completion, prior to final request for payment.

C. For items of work where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing the date of acceptance as the start of the warranty period.

1.5 DURATION OF WARRANTIES, BONDS, AND SERVICE AGREEMENTS

Submit warranties, bonds, service and maintenance contracts as specified in the respective Sections of the Specifications.

END OF SECTION 01740

02100
DEMOLITION AND SITE PREPARATION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Site Preparation for this project includes but is not necessarily limited to:
1. Temporary fencing and protective barricades.
 2. Protection of trees and shrubs to remain..
 3. Removal of obstructions which interfere with work.
 4. Stripping of topsoil and vegetation from earth areas of site.
 5. Protection of active utilities and removal of utilities abandoned.
 6. Stripping and removal of existing paving to be replaced.

1.2 QUALITY ASSURANCE

- A. Workmen Qualifications: One person present during tree clearing and grubbing operations, thoroughly familiar with types of trees involved. Direct trimming of roots and limbs where required.
- B. Codes and Standards: Comply with pertinent codes and regulations, plus requirements of insurance carriers providing coverage for work

1.3 JOB CONDITIONS

- A. Dust Control: Prevent spread of dust during performance of work. Thoroughly moisten surfaces required to prevent dust nuisance to public, neighbors, and concurrent performance of other work on site.
- B. On-site Burning: Will not be permitted.
- C. Protection: Protect existing objects not to be removed. In event of damage, immediately make repairs and replacements necessary to approval of Architect at Contractor's expense.

PART 2 - PRODUCTS

2.1 BARRICADES AND FENCE MATERIALS:

- A. Materials required for barricades, tree protection and related fencing furnished by Contractor

2.2 FILL MATERIAL

- A. Fill Material: Clayey Sand (SC), clay gravel (GC) or sandy gravel (GM) approved by soil engineer.
- B. Under Building and Roads: Material from undercuts from under buildings and roads suitable for fill to bring other areas of site to grade.

2.3 TOPSOIL

- A. Selected topsoil from the site, properly stored and protected, free from roots, sticks, hard clay and stones which will not pass through a 2 in. Square opening.
- B. Provide imported topsoil of equal quality if required to accomplish the work.
1. Natural, fertile, friable soil, possessing characteristics of representative productive soils in the vicinity. Obtain from naturally well-drained areas, without admixture of subsoil and free from Johnson grass (sorgam halepense), nut grass (cyprus rotundus), and objectionable weeds and toxic substances. Topsoil furnished shall be free from trash, brush, and stones over 1 in. In diameter, and related extraneous material.

PART 3 - EXECUTION

3.1 PREPARATION:

- A. NOTIFICATION: Notify Architect at least two full working days before commencing work.
- B. SITE INSPECTION:

1. Prior to work of this Section, carefully inspect entire site and objects designated to be removed or preserved.
 2. Locate existing utility lines to be abandoned and determine requirements for disconnecting and capping.
 3. Locate existing active utility lines which are to remain and determine requirements for their protection.
- C. CLARIFICATION:
1. Drawings do not purport to show all objects existing on site.
 2. Before commencing work of this Section, verify with Architect all objects to be removed and all objects to be preserved.
- D. SCHEDULING:
1. Schedule work in a careful manner with necessary consideration for neighbors and public.
 2. Avoid interference with use of, and passage to and from, adjacent buildings and facilities.
 - E. Preserve in operating condition active utilities bordering or traversing site designated to remain. Protect property, including, but not limited to, valve boxes, poles, guys and related appurtenances. Repair damage to active utility, due to work under contract, to satisfaction of utility concerned.

3.2 STRIPPING TOPSOIL:

- A. During compacting operations, maintain optimum practicable moisture content required for compaction purposes in each lift of fill.
- B. Maintain moisture content uniform throughout the lift.
- C. Add water to the material at the site of excavation. Supplement, if required, by sprinkling the fill.
- D. At the time of compaction, maintain the water content of the material at optimum moisture content, plus or minus 2 percent, except as otherwise specified for embankments.
- E. Do not attempt to compact fill material that contains excessive moisture.
- F. Aerate material by blading, discing, harrowing or other methods to hasten the drying process.

3.3 PROTECTION

- A. Erect temporary barricades and fencing required for preparation and construction operation.

3.4 UTILITIES

- A. Protect and preserve in operating condition, active utility services that traverse or border site, and repair damages that occur to these services due to work performed during Contract period. Remove utility lines that are to be abandoned from building area.

3.5 STUMPS AND ROOTS

- A. Remove completely stumps and roots from areas within building walls and 5 feet outside building walls. Material resulting from grubbing becomes property of Contractor, to dispose of by him. Burn no material on premises.

3.6 OBSTRUCTIONS

- A. Remove existing obstructions from area to be occupied by work under this Contract unless otherwise specified herein, or specifically directed by Architect to remain.

3.7 REMOVAL OF DEBRIS AND CLEANING

- A. Remove and legally dispose of rubbish and debris found on demolition area at start of the work that resulting from demolition activities or deposited on site by others during the duration of contract. Keep project area and public right-of-way reasonably clear at all times. Upon completion of work remove temporary construction, equipment, salvaged materials, trash and debris leaving entire project area in neat condition.

END OF SECTION 02100 DEMOLITION AND PREPARATION

**02200
EARTHWORK**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Earthwork for this project includes but is not necessarily limited to:
 - 1. Filling and backfilling.
 - 2. Rough and finish grading of the site.
 - 3. Granular drainage fill.

1.2 SUMMARY

- A. Perform excavation regardless of type, nature or condition of materials encountered.
- B. All excavation under this Section is unclassified and no allowances will be made for nature of material encountered. Contractor shall make soil investigations as he considers necessary for his own determination of types of materials existing at the site.
- C. There will be no extra compensation for dewatering.

1.3 JOB CONDITIONS

- A. Dust Control: Control dust on and near the work if dust is caused by Contractor's operations during performance of the Work or if resulting from condition in which Contractor leaves the site.

1.4 DEFINITIONS:

- A. Relative Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by the Standard Proctor Test, ASTM D698, or as determined by the Modified Proctor Test, ASTM D1557, as applicable. Corrections for oversized material may be applied to either the as-compacted field dry density or the maximum dry density, as determined by the Architect.
- B. Optimum Moisture Content: Moisture content of the material for which the maximum dry density is obtained as determined by ASTM D698 or D1557. Field moisture contents shall be determined on the basis of the fraction passing the 3/4" sieve.
- C. Completed Course: A course or layer that is ready for the next layer or the next phase of construction.

1.5 SUBMITTALS:

- A. Provide the following:
 - 1. Samples of all imported material.
- B. All fill material requires approval prior to placement.

PART 2 - PRODUCTS

2.1 FILL:

- A. Free from roots, organic matter, trash and debris with maximum particle size of 1 ½".
- B. Imported fill is to consist of clayey sand (SC), sandy clay (CL) or clayey gravel (GC).
- C. Alternate materials having a liquid limit not greater than 45 and approved by the Architect.
- D. It is intended that fill be obtained from the site to the maximum extent possible.

2.2 IMPORTED GRANULAR FILL

- A. Imported granular fill is to consist of a natural or artificial mixture of gravel and soil mortar, uniformly well graded from coarse to fine.

2.3 TOPSOIL

- A. Selected topsoil from the site, properly stored and protected, free from roots, sticks, hard clay and stones which will not pass through a 2 in. Square opening.

- B. Provide imported topsoil of equal quality if required to accomplish the work.
 - 1. Natural, fertile, friable soil, possessing characteristics of representative productive soils in the vicinity. Obtain from naturally well-drained areas, without admixture of subsoil and free from Johnson grass (sorgam halepense), nut grass (cyprus rotundus), and objectionable weeds and toxic substances. Topsoil furnished shall be free from trash, brush, and stones over 1 in. In diameter, and related extraneous material.

2.4 COMPACTION EQUIPMENT

- A. Provide compaction equipment of suitable type and adequate to obtain the densities specified.
- B. Operate compaction equipment in strict accordance with the manufacturer's instructions and recommendations.
- C. Maintain equipment in such condition that it will deliver the manufacturer's rated compactive effort.
- D. Hand-operated equipment shall be capable of achieving the specified densities.

2.5 MOISTURE CONTROL EQUIPMENT

- A. Provide equipment for applying water of a type and quality adequate for the work; it shall not leak and shall be equipped with a distributor bar or other approved device to assure uniform application.
- B. Provide equipment for mixing and drying out material consisting of blades, discs or other approved equipment.

2.6 WATER REMOVAL EQUIPMENT

- A. Provide and operate equipment adequate to keep excavation and trenches free of water.

2.7 SELECTED MATERIAL ACCEPTANCE

- A. Provide samples for testing representative of the actual material to be installed in the work. Take samples from material stockpiled. Depending on the uniformity of the material, Architect may request additional samples.
- B. Forward test results to Architect at least 10 days before the material is required for use. If tests indicate that the material does not meet specification requirements, the material shall not be installed in the work.
- C. Material which is placed in the work but does not conform to the specification requirements shall be removed and replaced at the Contractor's expense.

2.8 OTHER MATERIALS

- A. Provide materials, not specifically described but required for proper completion of work of this section, selected by Contractor subject to Architect's approval.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING:

- A. Complete clearing and grubbing work as specified in Section 02100 prior to beginning work in this Section.

3.2 MOISTURE CONTROL:

- A. During compacting operations, maintain optimum practicable moisture content required for compaction purposes in each lift of fill.
- B. Maintain moisture content uniform throughout the lift.
- C. Add water to the material at the site of excavation. Supplement, if required, by sprinkling the fill.
- D. At the time of compaction, maintain the water content of the material at optimum moisture content, plus or minus 2 percent, except as otherwise specified for embankments.
- E. Do not attempt to compact fill material that contains excessive moisture.
- F. Aerate material by blading, discing, harrowing or other methods to hasten the drying process.

3.3 FINISH SITE GRADING AND TOPSOIL PLACEMENT

- A. Perform earthwork to lines and grades as shown with proper allowance for topsoil. .
- B. Provide a minimum 4" depth of topsoil in all area within the limits that are disturbed during the course of this work except areas shown to receive sod.
 - 1. Areas to receive sod: After subgrade preparation, furnish, place, and spread 3" minimum thickness of topsoil over earth areas to be sodded. Do not spread topsoil in frozen or muddy conditions. Make allowance for settlement to obtain 3" finished full depth of topsoil. Till thoroughly areas where existing topsoil has not been removed to depth of at least 3" until condition of soil is friable and of uniform texture. Remove stones over 1" in diameter, sticks, and rubbish.
- C. Shape, trim and finish slopes to conform with the lines, grades and cross section shown.
- D. Make slopes free of loose exposed roots and stones exceeding 3" in diameter.
- E. Round tops of banks to circular curves, in general, not less than a 6' radius.
- F. Neatly and smoothly trim rounded surfaces.'

3.4 DISPOSAL OF EXCESS EXCAVATION

- A. Dispose of excess excavated materials, not required or suitable for use as backfill or fill off-site.

END OF SECTION 002200 EARTHWORK

**02245
FINISH GRADING**

PART 1 – GENERAL

- 1.1 WORK SPECIFIED ELSEWHERE**
A. EARTHWORK Section 02200

PART 2 - PRODUCTS

- 2.1 FILL:**
A. Any additional fill required for finish grading shall meet requirements of Section 02210.

PART 3 - EXECUTION

- 3.1 SITE FILL:**
A. Fill all areas where settlement has occurred.
B. General site fill shall be compacted to density of 85% of the maximum density (Standard Proctor).
C. Fill in areas to receive pavement shall be compacted in accordance with Section 02210
- 3.2 FINISH GRADING:**
A. Complete finish grading operations after building is completed, utilities installed, site improvements completed; all materials, rubbish and debris removed from site.
B. No debris or rubbish shall be buried in any backfill nor on the building site.
C. Grade at perimeter of building to shed water away from building on all sides.

END OF SECTION 02245 FINISH GRADING

02245
FINISH GRADING

PART 1 – GENERAL

- A. Provide storm water drainage structures and pipe as indicated on the utility site plan of the drawings and specified hereinafter.

PART 2 - PRODUCTS

- A. Materials
- i) Concrete for drainage structure shall conform to division 3.
 - ii) Reinforced concrete pipe shall conform to ASTM C-76.
 - iii) Standard concrete pipe shall conform to ASTM C-14.
 - iv) Corrugated galvanized metal pipe shall conform to AASHO-M-36.
 - v) Joints are to be specified in division 15 for "sewer pipe".
- B. Drainage structures -constructed as detailed on drawings.
- i) Frames, covers and gratings - castings shall be uniform quality, free from blowholes, porosity, hard spots, shrinkage distortions or other defects. Materials shall conform to ASTM Specifications for Gray Iron. All castings shall be manufactured true to pattern and component parts shall fit together in a satisfactory manner. Round frames and covers shall be of a non-rocking design, or shall have machined bearing surfaces to prevent rocking or rattling. Castings shall be heavy duty (except as noted). Shall be equal to units manufactured by Neenah Foundry Company.

PART 3 - EXECUTION

- a) Excavation
- i) Perform excavation of whatever substance encountered to depths shown on drawings and necessary for proper drainage.
 - ii) Do not carry excavations below required level. Excess excavations shall be backfilled with compact sand.
 - iii) Remove unstable soil and replace with sand.
 - iv) Grade ground adjacent to excavations to prevent water running in.
 - v) Refer to Division 15 and Utility Site Plan.
- b) Trenching
- i) Excavate trenches with nearly vertical sides to depths and widths required for installation of work and tamping backfill. Trenches shall be wood sheathed as necessary to prevent cave-ins, injury to work or workmen.
 - ii) Shape bottom of trenches accurately to exact grades so that pipe shall bear on undisturbed soil. Form Bell Holes by hand after bottom of trench has been graded. Remove unstable soil and replace with compacted sand.
- c) INSTALLATION
- i) Bedding surface shall provide a firm foundation, carefully shaped to line in grade. Lay concrete pipe with hubs up grade. Joints shall conform to specification for "Sewer Pipe" (see Division 15).
- d) Backfilling
- i) Material - refer to Section 02220
 - ii) After piping has been installed and approved by architect, backfill trenches in 4" layers, hand tamping over and around pipe to a height of at least 2 feet above pipe. Do not disturb underlying work. Remainder of backfill shall be placed in 6" layers and brought to grade, compacted to density of surrounding soil.

- iii) Backfill around drainage structures in maximum 8" lifts and compact to density of adjacent original material.
- e) Replacing pavement, etc.
- i) Repair all existing pavement, curbs, etc. in accordance with governing authorities.

END OF SECTION 02500 SITE DRAINAGE

02520
PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.1 SUBMITTALS

- A. Provide test reports in referenced sections for concrete.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
 - 1. Use flexible spring steel forms or laminated boards to form radius bends as required.
- B. Coat forms with a nonstaining form release agent that will not discolor or deface surface of concrete.
- C. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM 185.
- D. Reinforcing bars: Deformed steel bars, ASTM 615, Grade 60.
- E. Fabricated Bar Mats: Welded or clip-assembled bar or rod mats, ASTM A 184. Use ASTM A 615, Grade 60 steel bars, unless otherwise indicated.
- F. Joint Dowel Bars: Plain steel bars, ASTM 615, Grade 60. Cut bars true to length with ends square and free of burrs.
- G. Concrete Materials: Comply with requirements of applicable Division 3 sections for concrete materials, admixtures, bonding materials, curing materials, and others as required.
- H. Liquid-Membrane Forming and Sealing Curing Compound: Comply with ASTM C 309, Type I, Class A. Moisture loss no more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal/

2.2 CONCRETE MIX, DESIGN, AND TESTING

- A. Comply with requirements of applicable Division 3 sections for concrete mix design, sampling, and testing, and quality control as herein specified.
- B. Design Mix to produce normal-weight concrete consisting of Portland cement, aggregate, water-reducing or high-range water-reducing admixture (superplasticizer), air entraining admixture, and water to produce the following properties:
 - 1. Compressive Strength: 4,000 psi, minimum at 28 days, unless otherwise indicated.
 - 2. Slump Limits: 8 inches minimum for concrete containing high-range water-reducing admixture (superplasticizer), 3 inches for other concrete.
 - 3. Air Content: 5 to 8 percent.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION:

- A. Remove loose material from compacted subbase immediately before placing concrete.
- B. Proof-Roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

3.2 FORM CONSTRUCTION:

- A. Set forms to required grades and lines, braced and secured. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- B. Check completed formwork for grade and alignment to following tolerances:

1. Top of forms not more than 1/8 inch in 10 feet.
 2. Vertical face on longitudinal axis, not more than 1 /4 inch in 10 feet.
- C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

3.3 REINFORCEMENT

- A. Locate, place and support reinforcement as specified in Division 3 sections, unless otherwise indicated.

3.4 CONCRETE PLACEMENT

- A. General: Comply with requirements of Division 3 sections for mixing and placing concrete, and as herein specified.
- B. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than 1/2 hour, place a construction joint.
- C. Fabricated Bar Mats: Keep mats clean and free from excessive rust, and handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

3.5 JOINTS

- A. General: Comply with requirements of Division 3 sections for mixing and placing concrete, and as herein specified.
- B. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than 1/2 hour, place a construction joint.
- C. Weakened-Plane (Contraction) Joints: Provide weakened-plane (contraction) joints, sectioning concrete into areas. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:
1. Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.
 2. Sawed Joints: Form weakened-plane joints with powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.
 3. Inserts: Use embedded strips of metal to form weakened-plane joints. Set strips into plastic concrete and carefully remove strips after concrete has hardened.
- D. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for more than 1/2 hour, except where such placements terminate at expansion joints.
1. Construct joints as shown or, if not shown, use standard metal keyway-section forms.
 2. Where load transfer-slip dowel devices are used, install so that one end of each dowel bar is free to move.
- E. Expansion Joints: Provide pre molded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.
1. Locate expansion joints at 50 feet o.c. for each pavement lane unless otherwise indicated.
- F. Extend joint fillers full width and depth of joint, not less than 1 /2 inch or more than 1 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.
- G. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.

- H. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.
- I. Fillers and Sealants: Comply with requirements of applicable Division 7 sections for preparation of joints, materials, installation, and performance.

3.6 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
- B. After floating, test surface for trueness with a 10-ft. straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2-inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. After completion of floating and when excess moisture or surface sheen has disappeared, complete troweling and finish surface as follows:
 - 1. Broom finish by drawing a fine-hair broom across concrete surface perpendicular to line of traffic.
 - a. On inclined slab surfaces, provide a coarse, non-slip finish by scoring surface with a stiff-bristled broom, perpendicular to line of traffic.
- E. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Architect.

3.7 CURING

- A. Protect and cure finished concrete paving in compliance with applicable requirements of Division 3 sections. Use membrane-forming curing and sealing compound or approved moist-curing methods.
- B. Antispalling Treatment: Apply treatment to concrete surfaces no sooner than 28 days after placement, to clean, dry concrete free of oil, dirt, and other foreign material. Apply curing and sealing compound at a maximum coverage rate of 300 s.f. per gallon. Apply antispalling compound in 2 sprayed applications. First application at rate of 40 sq. yds. per gal.; second application, 60 sq. yds. per gallon. Allow complete drying between applications.

3.7 REPAIRS AND PROTECTIONS

- A. Repair or replace broken or defective concrete.
- B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- C. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

END OF SECTION 02520-PORTLAND CEMENT CONCRETE PAVING

**031 31 00
SOIL TREATMENT**

PART 1 - GENERAL

- 1.1 SUMMARY:** Soil treatment for termite control, complete.
- 1.2 SUBMITTALS:** In compliance with Section 01300, submit manufacturer's technical data, name of chemical, rates of application, and application instructions.
- 1.3 QUALITY ASSURANCE:**
- A. Complying with requirements of Arkansas Plant Board, or other governing authority.
 - B. Engage a professional pest control operator, licensed in accordance with regulations of governing authorities for application of soil treatment solution.
- 1.4 PROJECT CONDITIONS:** Do not apply soil treatment solution until excavating, filling and grading operations are completed. Do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.
- 1.5 WARRANTY:** Furnish 5 year warranty certifying that applied soil termiticide treatment will prevent infestation of subterranean termites and, that if subterranean termite activity is discovered during the warranty period, Contractor will re-treat the soil and repair or replace damage caused by termite infestation.

PART 2 - PRODUCTS

- 2.1 MATERIALS:** Use termiticide carrying an EPA registration number, and approved by Arkansas Plant Board or other governing authority.

PART 3 - EXECUTION

- 3.1 APPLICATION:**
- A. Surface Preparation: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake and level soil to be treated, except previously compacted areas under slabs and foundations.
 - B. Concentrations and Application Rates: Comply with label directions of termiticide, and with Arkansas State Plant Board or other governing authority specifications and recommendations for the following areas:
 - 1. Under slab-on-grade, sidewalks, platforms, ramps, and paving within the border of roof line.
 - 2. Floor drains and traps.
 - 3. Below expansion joints, control joints, and to all electrical and plumbing conduits and pipes that penetrate the concrete slab.

4. Along both sides of foundation walls, around perimeter of concrete footings, beams, and piers that extend below grade.
- C. Allow not less than 12 hours for drying after application before beginning construction activities.
- D. Post signs in the areas of application warning workers that soil termiticide treatment has been applied. Remove signs when areas are covered by other construction.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

END OF SECTION 31 31 00 Soil Treatment

03301
CAST-IN PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section specifies all cast-in-place concrete, including formwork, reinforcing steel, mix design, placement procedures, and finishes.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced:

- A. ACI 301, "Specifications for Structural Concrete for Buildings."
- B. ACI 304, "Guide for Measuring, Mixing, Transporting and Placing Concrete."
- C. ACI 315, "Details and Detailing of Concrete Reinforcement."
- D. ACI 318, "Building Code Requirements for Reinforced Concrete."
- E. ACI 347, "Guide to Formwork for Concrete."
- F. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
- G. Concrete Reinforcing Steel Institute (CRSI), "Placing Reinforcing Bars."
- H. ASTM S 615, "Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement."
- I. ASTM C 94, "Specifications for Ready-Mixed Concrete."

1.3 SUBMITTALS

- A. Manufacturer's Product Data: Manufacturers' product data with application and installation instructions for proprietary materials and items, including admixtures, bonding agents, form release agents, patching compounds, waterstops, joint systems, and others as requested by the Owner's Representative.
- B. Shop Drawings For Reinforcing Steel: Reinforcing Steel: Shop drawings for reinforcement with details for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Details and Detailing of Concrete Reinforcement" and ACI SP 66 "ACI Detailing Manual". The fabricator shall check the contract drawings for detailing and report errors or inconsistencies discovered therein to the Owner's Representative before starting shop detailing.
- C. Quality Control Submittals:
 - 1. Test Reports: Laboratory test reports for concrete materials and mix design tests.
 - 2. Certificates: Material certificates may be supplied in lieu of material laboratory test reports when permitted by Owner's Representative. Material Certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride is not contained in the admixtures.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:
 - 1. ACI 318, "Building Code Requirements for Reinforced Concrete."
 - 2. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
- B. The work shall be in conformance with ACI 318, part titled "Construction Requirements," except as specified herein.
 - 1. Concrete Compressive Strength: Concrete mixes shall be proportioned to obtain compressive strength in 28 days as noted in the drawings and shall be in accordance with the ACI recommendations specified in Article 1.2 "References" above.

2. Air Content: Total air content of concrete shall be maintained between 2 and 4 percent by volume of concrete except as noted in the drawings.
3. Slump: Slump for concrete containing HRWR (superplasticizers) admixtures shall be not more than 8 inches after adding HRWR to site-verified 2-to-3 inches slump concrete.
4. Use of approved admixtures shall be in strict compliance with manufacturer's instructions.
5. The use of calcium chloride or admixtures containing chloride will not be permitted.
6. Workmanship: The Contractor is responsible for correction of concrete work which does not conform to the specified requirements, including strength, tolerances, and finishes. Correct deficient concrete as required by the specifications.

1.5 DELIVERY, STORAGE, AND HANDLING

All materials shall be stored in dry and protected locations in accordance with the referenced codes and standards and manufacturers' recommendations. Store materials to prevent contamination.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
- B. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to conform to joint system shown on drawings.
- C. Form Release Agent: Provide commercial formulation form release agent compounds with a maximum of 350 mg/l volatile organic compound (VOC) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces requiring bond or adhesion, or impede the wetting of surfaces to be cured with water. Release agents shall be used in strict accordance with manufacturers' recommendations.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Welded wire mesh: ASTM A 185.
- C. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place.
 1. Use wire bar type supports complying with CRSI recommendations.
 2. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II. Use one brand of cement throughout the project unless otherwise acceptable to the Owner's Representative.
- B. Normal Weight Aggregates: ASTM C 33.
- C. Water: Clean, fresh, and potable.
- D. ADMIXTURES: PROVIDE ADMIXTURES PRODUCED BY ESTABLISHED REPUTABLE MANUFACTURERS AND USE IN COMPLIANCE WITH THE MANUFACTURER'S PRINTED DIRECTIONS. ALL ADMIXTURES SHALL BE CERTIFIED BY MANUFACTURE TO BE COMPATIBLE WITH OTHER REQUIRES ADMIXTURES.
 1. AIR-ENTRAINING ADMIXTURE: ASTM C 260.
 2. WATER-REDUCING ADMIXTURE: ASTM C 494, TYPE A.
 3. SET-CONTROL ADMIXTURES: ASTM C 494, AS FOLLOWS:
 - a. TYPE D, WATER REDUCING AND RETARDING.

- b. TYPE E, WATER-REDUCING AND ACCELERATING.
- E. HIGH-RANGE WATER-REDUCING ADMIXTURE (SUPER PLASTICIZER): ASTM C 494, TYPE F OR TYPE

2.4 RELATED MATERIALS

- A. Waterstops: Waterstops, if required, shall be fabricated of virgin polyvinyl chloride with additives and shall comply with Corps of Engineers CRD-C 572. Configuration of waterstop shall be as shown on the drawings.
- B. Vapor Retarder: Provide vapor retarder of Polyethylene sheet not less than 8 mils thick that is resistant to deterioration when tested in accordance with ASTM E 154.

PART 3 - EXECUTION

3.1 FORMS:

General: Design, erect, support, brace, and maintain formwork to support static and dynamic loads that might be applied during construction. Design of formwork for structural stability and efficiency is Contractor's responsibility. Construct formwork so concrete elements are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACI 347.

3.2 PLACING REINFORCING:

- A. General: Comply with the specified codes and standards and Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for details and methods of reinforcement placement and support and as herein specified.
- B. All bars shall be free of mill scale, loose or thick rust, grease, paint, oil, dirt, or other defects affecting strength or durability.
- C. All bending shall be done in the fabricating plant before shipment unless otherwise specified or permitted by Owner's Representative. All bends shall be made cold. The minimum radius of bends shall be four times the diameter of the bar and as specified in ACI 318.
- D. All reinforcing steel shall be accurately placed and during the placing of concrete shall be firmly held in place. Steel reinforcement shall not be welded.

3.3 CONCRETE PLACEMENT

- A. General: Place concrete in compliance with the practices and recommendations of ACI 304 and as specified herein. Do not place any concrete until the Owner's Representative has reviewed the results of the design mix 28-day test breaks and approval is given to proceed.
- B. Placing Concrete: All mixing, conveying and placing of concrete shall meet the requirements of ACI 318. Where concrete is to be placed in freezing or near-freezing weather, it shall be protected in accordance with recommended practice for cold weather concreting (ACI 306). Where concrete is placed in hot weather, the recommended practice for hot weather concreting (ACI 305) shall be followed.
- C. Concrete Floors on Ground: The subgrade shall be in a moist condition at the time the concrete is placed. If necessary it shall be well sprinkled with water not less than 6 nor more than 20 hours in advance of placing concrete. If it becomes dry prior to actual placing of concrete, it shall be sprinkled again but pools of water should not be formed and the subgrade shall not be muddy or soft when the concrete is placed.
- D. Consolidation of Concrete: Concrete shall be consolidated with internal concrete vibrators supplemented by hand spading, rodding, and tamping. Vibrating equipment shall be adequate to thoroughly consolidate the concrete.

3.4 CONCRETE CURING AND PROTECTION

- A. Construction joints in slabs-on-grade shall not be spaced at more than 60 feet, unless approved by the Owner's Representative.
- B. No reinforcement, corner protection angles, or other fixed metal items shall be run continuous through joints containing expansion-joint filler. At construction joints reinforcement shall be interrupted 2 inches clear on each side.

1. Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.
 2. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
 3. If joint pattern is not shown, provide construction or contraction joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
- C. Isolation Joints: Where indicated, joints between interior slabs on grade and vertical surfaces, unless otherwise shown, shall be of 1/4 inch premolded expansion material extending full slab depth. The perimeters of slabs at the joints shall be free of fins, rough edges, spalling, or other unsightly appearance.

3.6 FINISHING FORMED SURFACES

- A. Rough Form Finish:
1. Provide as-cast rough form finish to formed concrete surfaces that are to be concealed in the finished work or by other construction, unless otherwise indicated.
 2. Standard rough form finish shall be the concrete surface having the texture imparted by the form facing material used, with tie holes and defective areas repaired and patched and all fins and other projections exceeding 1/2" in height rubbed down or chipped off.
- B. Smooth Form Finish: Provide smooth form finish to formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. Repair and patch defective areas with fins and other projections completely removed and smoothed.

3.7 MONOLITHIC SLAB FINISHES

- A. Float Finish:
1. Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified. Slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, or as otherwise indicated.
 2. After screeding, consolidating, and leveling concrete slabs, do not work the surface further until ready for floating. Begin floating, using float blades or flat shoes only, when the surface water has disappeared or when the concrete has stiffened sufficiently to permit the operation of a power-driven float, or both. Consolidate the surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F/F 18 - F/L 15 measured according to ASTM E 1155. Cut down high spots and fill all low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat the surface to a uniform, smooth, granular texture.
- B. Trowel Finish:
1. Apply trowel finish to monolithic slab surfaces that are to be exposed to view unless otherwise shown or specified, and slab surfaces that are to be covered with resilient flooring, thin-set ceramic or quarry tile, paint, or other thin-film finish coating systems. Tops of concrete curbs shall receive steel trowel finish.
 2. After floating, begin the first trowel finish operation using a power-driven trowel. Begin final troweling when the surface produces a ringing sound as the trowel is moved over the surface. Consolidate the concrete surface by the final hand troweling operation, free of trowel marks, uniform in texture and appearance, and

finish surfaces to tolerances of F/F 20 - F/L 17. Grind smooth surface defects that would telegraph through applied floor covering system.

- C. Nonslip Broom Finish:
 - 1. Apply a nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
 - 2. Immediately after trowel finishing, slightly roughen the concrete surface by brooming in the direction perpendicular to the main traffic route. Use fiber-bristle broom unless otherwise directed. Coordinate the required final finish with the Owner's Representative before application, 60 sq. yds. per gallon. Allow complete drying between applications.

3.7 REPAIRS AND PROTECTIONS

- A. Repair or replace broken or defective concrete.
- B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- C. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

END OF SECTION 03301-CAST-IN PLACE CONCRETE

**SECTION 03351
COLORED CONCRETE FINISHING**

PART 1 GENERAL

1.1 PROJECT DESCRIPTION

- A. Section includes
 - 1. Concrete floor stain (CFS)
 - 2. Concrete floor sealer
- B. Related Sections
 - 1. Division 03 Section "Cast-In-Place Concrete"
 - 2. Division 07 Section "Joint Sealant"

1.2 SUBMITTALS

- A. Samples for Initial Selection: For manufacture's standard color chart.
- B. Quality Assurance/Control Submittals
 - 1. Product Data: include manufacture's specifications, surface preparation and application instructions for each surface to receive coatings, and protection of adjacent surfaces.
- C. Closeout Submittals:
 - 1. Maintenance Instructions: Submit manufacture's standard color chart.

1.3 QUALITY ASSURANCE

- A. Installers Qualifications:
 - 1. Successful experience in application of similar concrete floor stains.
 - 2. Employ process trained for application of concrete floor stains.
- B. Mock-ups: Install mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Install sealer mock-ups of at least 10 sf of typical flooring and base condition for each color in locations directed by A/E
 - 2. Approved mock-ups may become part of the completed work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials in manufacture's original, unopened, undamaged containers with identifying labels intact.
- B. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by the manufacturer.
 - 1. Store materials in a dry area at temperatures between 55 and 100 degrees f. Provide adequate ventilation and keep away from ignition sources.
- C. Waste Management and Disposal: As specified in Division 01 Section "Construction Waste Management and Disposal"

1.5 PROJECT CONDITIONS

- A. Environmental Requirements/Conditions: Comply with manufacture's requirements for installation in environmental conditions as representative of finish flooring systems.
 - 1. Comply with manufacture's recommendations for optimum temperature and humidity conditions.
 - a. Ambient and surface temperatures between 55 and 100 degrees f.
 - 2. Do not install prescribed system treatment until space is enclosed and weatherproof and ambient temperature and humidity conditions will be maintained at values similar to final conditions.
 - 3. Substrate
 - a. New concrete cures minimum 28 days.
 - b. Not frozen or frost covered.
 - c. Clean, sound and dry
 - 4. Ensure adequate ventilation in application areas.

1.6 COORDINATION

- A. Coordinate the work with concrete placement, initial finishing and concrete curing,

PART 2 PRODUCTS

2.1 MANUFACTURES

- A. Products: Subject to compliance with requirements, provide one of the products specified.
 - 1. Lithochrome Chemstain Classic; LM scofield Company
 - 2. Pro Patina Stains; Dayton Superior
 - 3. Kemiko Stone Tone Stain; Kemiko Concrete Products
 - 4. ChemTone Acid Stain; Decosup Inc.
 - 5. Consolideck GemTone Colorcoat; Prosoco, Inc.
- B. Products of other manufactures will be considered for acceptance provided the equal or exceed the material requirements and functional qualities of specified product. Request for a/e approval must be accompanied by the "Substitution Request Form" and complete technical data for evaluation. All materials for evaluation must be received by the project manager and specification department at least 10 days prior to bid due date. Additional approved manufactures will be issues by Addendum

2.2 MATERIALS

- A. Concrete Floor Stain:
 - 1. Combination of acid solution, wetting agents, and metallic ions. When mixed with water, chemically combines with Portland cement to form permanent colors.
 - 2. A water-based stain that penetrates and colors cementitious surfaces without etching the concrete.
- B. Floor Sealer: Acrylic water-based urethane clear sealer, nonyellowing, resistant to blush, and satin finish or a modified silane system as recommended by manufacturer for preventing staining by waterborne and oil substances.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive concrete floor stain and sealer. Notify A/E if surfaces from damage during product installation.

3.2 PREPERATION

- A. Adjacent Surface Projection: Project adjacent work areas and finish surfaces from damage during product installation.
- B. Clean surfaces to receive coatings remove loose and foreign matter that could interfere with application or performance of stain and sealer.
- C. Mechanically prepared surface of slab to receive finish per manufacturer's instructions. Acid etching is not acceptable.

3.3 INSTALLATION

- A. Comply with manufacture's product data, including product technical bulletins, product catalog installation instructions and product cartoon instructions and procedures established during preparation of mock-up.
- B. Control depth of color by adjusting volume of stain applied to floor.
- C. Apply two coats of concrete floor stain. Allow floor to completely dry after each coat. Do not scrub between coats.
- D. After floor has completely dried, scrub of stain residue in accordance with manufacturer's instructions. Allows floor to completely dry.
- E. Concrete Floor Sealer: Apply concrete floor sealer over concrete floor stain in accordance with manufacturer's instructions.

3.4 INSTALLATION

- A. Cleaning: Clean work area and remove installation material debris.
- B. Protection: Protection installed product's finish surfaces from damage during construction.
- C. Protect concrete surfaces from foot traffic for a minimum of 24 hours.
- D. Avoid washing concrete surfaces for a minimum of 48 hours.

END OF SECTION 03351 COLORED CONCRETE FINISHING

SECTION 06100
ROUGH CARPENTRY

PART 1 GENERAL

1.1 DEFINITIONS

- A. Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated.

1.2 PRODUCT HANDLING

- A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.
 - 1. For lumber and plywood pressure treated with waterborne chemicals, sticker between each course to provide air circulation.

1.3 PROJECT CONDITIONS

- A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow attachment of other work.

PART 2 PRODUCTS

2.1 LUMBER, GENERAL

- A. Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Grade Stamps: Factorymark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
 - 1. For exposed lumber apply grade stamps to ends or back of each piece.
- C. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
 - 1. Provide dressed lumber, S4S, unless otherwise indicated.
 - 2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.

2.2 DIMENSION LUMBER

- A. For structural framing (2" to 4" thick, 5" and wider), provide the following grade and species:
1. No. 2 grade.
 2. Southern Pine graded under SPIB rules.

2.3 BOARDS

- A. Exposed Boards: Where boards will be exposed in the finished work, provide the following:
1. Moisture Content: 15 percent maximum, "MC15".
 2. Painted finish, provide No. 1 Boards per SPIB rules.

2.4 MISCELLANEOUS LUMBER

- A. Provide wood for support or attachment of other work including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown, and as follows:
- B. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
- C. Grade: Standard Grade light framing size lumber of any species or board size lumber as required.

2.5 MISCELLANEOUS MATERIALS

- A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.
1. Where rough carpentry work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with a hotdip zinc coating (ASTM A 153).

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
- B. Set carpentry work to required levels and lines, with members plumb and true and cut and fitted.

- C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.
- D. Countersink nail heads on exposed carpentry work and fill holes.
- E. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.2 WOOD GROUNDS, NAILERS, BLOCKING AND SLEEPERS

- A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- C. Provide permanent grounds of dressed, preservative treated, keybevelled lumber not less than 1 1/2" wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

3.3 WOOD FURRING

- A. Install plumb and level with closure strips at edges and openings. Shim as required for tolerance of finished work.

3.4 WOOD FRAMING, GENERAL

- A. Provide framing members of sizes and on spacings shown, and frame openings as shown.
- B. Anchor and nail as shown, and to comply with "Recommended Nailing Schedule" of "Manual for House Framing" and "National Design Specifications for Wood Construction" published by N.F.P.A.

END OF SECTION 06100

SECTION 06191
PREFORMED WOOD TRUSSES

PART 1 GENERAL

1.1 QUALITY ASSURANCE:

- A. Contractor and Prefabricated Wood Truss Manufacturer shall be responsible for providing the structural engineering design of all wood trusses and roof framing attached to such trusses called for on the project in conformance with the stricter requirements of either the 1991 Standard Building Code (SBC) including all the loading criteria of Chapter 12 of the SBC; the local building code, and/or other governing codes. Contractor is to submit a letter signed by a structural engineer registered in the state of Arkansas certifying in the precise wording of the above that the design of these trusses so conforms to these requirements, including seismic design data and connections.
- B. Lumber grading rules and wood species: PS20-70.
- C. Grade Marks: Identify lumber by official grade mark containing symbol of grading agency, mill number or name, grade of lumber, species or species group or combination designation, rules under which graded, and condition of seasoning at time of manufacture.
- D. Requirements of Regulatory Agencies:
 - 1. Working stresses and connector loads: National Design Specifications for Stress Grade Lumber and its fastenings, National Forest Products Association (NFPA).
 - 2. Design Specifications: Design Specifications for Light Metal Plate Connected Wood Trusses, Truss Plate Institute.
 - 3. Design, Fabrication and Erection: Conform to local building code or other governing code and requirements of 1.2, A above.
- E. Qualifications of Fabricator: Minimum of three years experience in manufacturing comparable wood trusses.
- F. Allowable Tolerances:
 - 1. Connector locations:
 - a. Toothed connectors $\pm 1/4"$ (7mm) from location shown on shop drawings.
 - b. Split Ring and Shear Plate Connectors: Centers $\pm 1/16"$ (2mm) from location shown on shop drawings.
 - 2. Length of members:
 - a. Up to 20 ft. (6.1 m): $\pm 1/16"$
 - b. Over 20 ft. (6.1m): $\pm 1/32"$ (1mm)
 - 3. Square end cuts:
 - 4. Openings between members and assembled trusses:

- a. Tension Members: Maximum 1/16" (2 mm)
- b. Compression Members: Maximum 1/32" (1mm)

1.2 PRODUCT DELIVERY, STORAGE, AND HANDING:

- A. Handle prefabricated trusses with care, and in accordance with manufacturer's instructions.
- B. Stock pile or store trusses in position acceptable to Architect.
- C. Provide bearing supports and bracings to avoid bending or overturning of trusses.
- D. Protect trusses from construction operations.

PART 2 - PRODUCTSA. Lumber

1. Dimensions:

- a. Indicated dimensions are nominal.
- b. Actual dimensions conform to PS 20-70.

- 2. Moisture Content: Not greater than required by species in conformance with National Design Specification for Stress-Grade Lumber and its Fastenings, NFPA.
- 3. Surfaces four sides (S4S).
- 4. Conform to published stress ratings of National Design Specifications for Stress-Grade Lumber and its Fastenings, NFPA.

B. Metal Connector Plates:

- 1. Galvanized sheet steel, ASTM-A-446-71.
- 2. Manufactured with holes, plugs, teeth, or prongs uniformly spaced and formed.

C. Hardware:

- 1. Bolts: FS FF-B-584-D
- 2. Nuts: FS FF-N-836-D
- 3. Lag Screws and Bolts: FS FF-B-561-C
- 4. Nails: FS FF-N-105-B

D. Split Rings: Tongue and groove joint, hot rolled carbon steel, ASTM A 36-70.

E. Shear Plates: Malleable iron, Grade 35018, ASTM A 47-68.

F. Gussests: Carbon steel plate, ASTM A 36-70.

2.2 FABRICATIONS:

- A. Manufacture trusses in permanent facility manned by skilled workmen.
- B. Open to inspection by Architect/Engineer.
- C. Cut truss members to accurate length, angle and size to assure tight joints for finished trusses.
- D. Assemble truss members in design configuration by securing tightly in jigs or with clamps.
- E. Include design camber when positioning members.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Verify that surfaces to receive trusses are free from irregularities and debris.
- B. Do not proceed with installation until unsatisfactory conditions are corrected.
- C. Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing is installed.
- D. Install permanent bracing and related components prior to application of loads to trusses.
- E. Tighten loose connectors.
- F. Restrict construction loads to prevent overstressing of truss members.
- G. Do not cut or remove truss members.

END OF SECTION 06191

**SECTION 06200
FINISH CARPENTRY**

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. Definition: Finish carpentry includes carpentry work which is exposed to view, is non-structural, and which is not specified as part of other sections.

1.2 QUALITY ASSURANCE

- A. Factory-mark each piece of lumber and plywood with type, grade, mill and grading agency identification; except omit marking from surfaces to receive transparent finish, and submit mill certificate that material has been inspected and graded in accordance with requirements if it cannot be marked on a concealed surface.

1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. Protect finish carpentry materials during transit, delivery, storage, and handling to prevent damage, soiling, and deterioration.
- B. Do not deliver finish carpentry materials, until painting, wet work, grinding and similar operations which could damage, soil, or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.4 JOB CONDITIONS

- A. Conditioning: Installer shall advise Contractor of temperature and humidity requirements for finish carpentry installation areas. Do not install finish carpentry until required temperature and relative humidity have been stabilized and will be maintained in installation areas.
- B. Maintain temperature and humidity in installation area as required to maintain moisture content of installed finish carpentry within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of woodwork shall determine optimum moisture content and required temperature and humidity conditions.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS QUALITY STANDARDS

- A. Softwood Lumber Standards: Comply with PS 20 and with applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
- B. Plywood Standard: Comply with PS/1 ANSI A199.1.
- C. Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.
- D. Hardwood Plywood Standard: Comply with PS 51.
- E. Woodworking Standard: Where indicated for a specific product comply with specified provision of the following:
 - 1. Architectural Woodwork Institute (AWI) "Quality Standards".

2.2 MATERIALS

- A. General:
 - 1. Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sized as required by PS 20 or to actual sizes and patterns as shown, unless otherwise indicated.
 - 2. Moisture Content of Softwood Lumber: Provide seasoned (KD) lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
 - 3. Moisture Content of Hardwood Lumber: Provide kiln-dried (KD) lumber having a moisture content from time of manufacture until time of installation within the ranges required in the referenced woodworking standard.
 - 4. Lumber for Transparent Finish (Stained or Clear): Use pieces made of solid lumber stock.
 - 5. Lumber for Painted Finish: At Contractor's option, use pieces which are either glued up lumber or made of solid lumber stock.
- B. Trim:
 - 1. Wood Trim
 - a. Paint grade; fir
 - b. Kitchen cabinet (faces): clear maple veneer with polyurethane (clear), pre-catalyzed lacquer finish.
 - c. Interior doors and window trim: clear maple with clear polyurethane finish.
 - d. Base, casing, and miscellaneous trim: Clear maple with oil finish.
 - e. Custom interior wood doors: Clear maple with oil finish.
- C. Miscellaneous Materials:

1. Fasteners and Anchorages: Provide nails, screws, and other anchoring devices of the type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications.
2. Blocking: Provide 2x blocking for Toilet and Bath Accessories, cabinets, etc.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition wood materials to average prevailing humidity conditions in installation areas prior to installing.

3.2 INSTALLATION

- A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes, or patterns.
- B. Install the work plumb, level, true, and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level countertops; and with 1/16" maximum offsets in revealed adjoining surfaces.
- C. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor finish carpentry work to anchorage devices or blocking built-in directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine finishing nail for exposed nailing, countersunk and filled flush with finished surface, and matching final finish where transparent is indicated.

3.1 ADJUSTMENT, CLEANING, FINISHING, AND PROTECTION

- A. Repair damaged and defective finish carpentry work wherever possible to eliminate defects functional and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean finish carpentry work on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.
- C. Protection: Installer of finished carpentry work shall advise Contractor of final protection and maintained conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION 06200

**SECTION 06402
ARCHITECTURAL WOODWORK**

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Plastic-laminate cabinets.
 2. Plastic-laminate countertops.
 3. Closet and utility shelving.
 4. Solid surface countertops. (Kitchen and bath counter tops)

1.2 DEFINITIONS

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.3 SUBMITTALS

- A. Product Data: For high-pressure laminate, cabinet hardware and accessories.
- B. Samples for Initial Selection:
1. Plastic laminates.
 2. Thermoset decorative panels.
 3. Solid surface.
- C. Samples for Verification:
1. Thermoset decorative-panels, 8 by 10 inches (200 by 250 mm), for each type, color, pattern, and surface finish, with edge banding on 1 edge.
 2. Corner pieces as follows:
 - a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 12 inches high by 12 inches wide by 6 inches deep.
 3. Exposed cabinet hardware and accessories, on unit for each type and finish.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards: for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
- C. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination".

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- D. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Products: Comply with the following:
 - 1. Hardboard: AHA A135.4.
 - 2. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
 - 3. Particleboard: ANSI A208.1, Grade M-2 Exterior Glue.
- C. Thermoset Decorative Panels: Particleboard or medium density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
 - 1. Provide banding complying with LMA EDG-1 on components with exposed or semi-exposed edges.
- D. High-Pressure Decorative Laminate: NEMA LD 3, grades, as required by woodwork quality standard.
- E. Solid Surface: A solid homogeneous material, a fully densified composite of modified resin and mineral filler.

2.2 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section.
- B. Hinges: Semi-concealed Hinges for Flush Overlay Doors: BHMA A156.9, B01521.
- C. Wire Pulls: Back mounted, solid metal, 4 inches long.
- D. Catches: Hinged Contained
- E. Shelf Rests: BHMA A156.9, B04013; plastic
- F. Drawer Slides: Side mounted, full-extension type; epoxy-coated steel with steel ball-bearings.

2.3 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

2.4 PLASTIC-LAMINATE CABINETS

- A. Grade: Premium.
- B. AWI Type of Cabinet Construction: Flush overlay.
- C. Laminate Cladding for Exposed Surfaces: High-pressure laminate complying with the following requirements:
 - 1. Horizontal Surfaces Other Than Tops: Grade HGS.
 - 2. Vertical Surfaces: Grade VGS.
 - 3. Surfaces Other Than Drawer Bodies:
 - a. Edges of Plastic-Laminate Shelves: Matching laminate color, pattern, and finish.
 - b. For semi-exposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, Grade CLS.
 - 4. Finish: As selected by Architect from laminate manufacturer's full range in the following categories:
 - a. Solid colors, matte finish.
 - b. Wood grains, matte finish.

2.5 PLASTIC-LAMINATE COUNTERTOPS

- A. Grade: Premium.
- B. High-Pressure Laminate Grade: HGS.
- C. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. As selected by Architect from manufacturer's full range of following categories:
 - a. Solid colors, matte finish.
 - b. Wood grains, matte finish.
- D. Grain Direction: Parallel to cabinet fronts.
- E. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- F. Core Material: Particleboard or medium density fiberboard.
- G. Core Material at Sinks: Particleboard made with exterior glue.
- H. Install integral sink bowls in countertops in shop.
- I. Drill holes in countertops for plumbing fittings and soap dispensers in shop.

2.6 SOLID SURFACE

- A. Short stock minimum 1/2" thick.
- B. Fabrication to be in accordance with manufacturers guide.

2.7 CLOSET AND UTILITY SHELVING

- A. Grade: Economy.
- B. Shelf Material: Thermoset decorative panel with PVC or polyester edge banding.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.
- B. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- C. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation.
- D. Install cabinets with no sag, bow, or other variation from a straight line.
- E. Fasten wall cabinets through back, near top and bottom, at ends.
- F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop or in accordance with manufacturers guides.
- G. Install countertops with no sag, bow, or other variations from a straight line.

3.2 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects: where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semi-exposed surfaces.

END OF SECTION 06402

**SECTION 07210
BUILDING INSULATION**

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Cavity wall insulation.
 - 2. Concealed building insulation.
 - 3. Spray Applied Insulation

1.2 QUALITY ASSURANCE

- A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements indicated without delaying the Work.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering insulation products that may be incorporated in the work include, but are not limited to, the following:
- B. Manufactures: Subject to compliance with requirements, provide insulation products by one of the following:
 - 1. Glass-Fiber Insulation
 - a. CertainTeed Corporation.
 - b. Knauf Fiber Glass GmbH
 - c. Owens-Corning Fiberglas Corporation.
 - d. Schuller International, Inc.
 - 2. Spray Applied Insulation
 - a. Demilec, Gaco Western

2.2 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
 - 1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.
- B. Unfaced Mineral-Fiber Blanket Insulation: Thermal insulation combining mineral fibers of type described below with thermosetting resins that comply with ASTM C 665, Type I (blankets without membrane facing)
 - 1. Mineral Fiber Type: Fibers manufactured from glass.
- C. Faced Mineral-Fiber Blanket Insulation: Thermal insulation combining mineral fibers of type described below with thermosetting resins that comply with ASTM C 665, Type III, Class A; with foil-scrim-kraft

1. Mineral-Fiber Type: Fibers manufactured from glass.

D.

1. SPRAY FOAM INSULATION:

- a. Water blown spray-applied system that cures to a semi-rigid and low-density foam. Dimensionally stable without diminishing insulating properties.
- b. Formaldehyde free and no ozone depleting materials
- c. Insulating Thicknesses:
 - 1 .At exterior walls: 6" thick (R-19) thickness.
 2. At Attic: 13" or thickness required to achieve R-38
 3. At interior walls: Fill voids to achieve sound barrier.

2.3 VAPOR RETARDERS

- A. Polyethylene Vapor Retarder: ASTM D 4379, ^ mils thick, with maximum permeance rating of 0.13 perms.
- B. Vapor Retarder Tape: Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.
- B. Protect Adjacent Surfaces

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, unsoiled, and has not been exposed at any time to ice and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Apply single layer of insulation to produce R value indicated.

3.4 PROTECTION

- A. General: Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07210

SECTION 07421
PREFORMED METAL ROOFING AND WALL PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Roof and Wall System consists of the manufacturer's standard standing-seam panels.

1.2 REFERENCES

A. General: Standards listed by reference form a part of this specification section. Standards listed are identified by issuing authority, abbreviation, designation number, title or other designation. Standards subsequently referenced in this Section are referred to by issuing authority abbreviation and standard designation.

B. ASTM International:

1. ASTM A 653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM A 792 – Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
3. ASTM A 1011 – Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
4. ASTM D 2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
5. ASTM D 4214 – Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
6. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

C. Underwriters Laboratories (UL):

1. UL 263 - Fire Tests of Building Construction and Materials.

D. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): "Architectural Sheet Metal Manual."

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Conduct preinstallation meeting to clarify Project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.4 ACTION SUBMITTALS

A. Product Technical Data: For each type of product required, including manufacturer's preparation recommendations, storage and handling requirements, and recommended installation methods.

C. Shop Drawings: Showing methods of installation, plans, sections, elevations and details of roof and wall panels, specified loads, flashings, vents, sealants, interfaces with all materials not supplied by the metal panel system manufacturer, and identification of proposed component parts and their finishes. Do not proceed with fabrication prior to approval of shop drawings.

D. Samples: Selection and verification samples for finishes, colors and textures. Submit two complete 6"x6" sample sets of each type of roof, gutter and downspout, panel, trim, clip and fastener required.

E. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

F. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.

G. Qualifications Statements: For manufacturer and installer.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For installed products including maintenance methods and precautions against cleaning materials and methods detrimental to finishes and performance.

B. Warranty: Warranty documents required in this section.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Provider of advanced installer training.
2. Minimum of ten years of experience in manufacturing metal wall panel systems.
3. Provider of products produced in a permanent factory environment with fixed roll-forming equipment.

B. Installer Qualifications:

1. At least five years of experience in the installation of metal wall panels.
2. Experience on at least five projects of similar size, type and complexity as this Project that have been in service for a minimum of two years with satisfactory performance of the wall panel system.
3. Employer of workers for this Project who are competent in techniques required by manufacturer for installation indicated and who shall be supervised at all times when material is being installed.

1.7 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with manufacturer's current printed product storage recommendations.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage: Store materials above ground, under waterproof covering, protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Provide proper ventilation of metal panel system to prevent condensation build-up between each panel and trim or flashing component. Tilt stack to drain in wet conditions. Remove strippable plastic film before storage under high-heat conditions. Store products in manufacturer's unopened packaging until just prior to installation.
- D. Handling: Exercise caution in unloading and handling metal panel system to prevent bending, warping, twisting and surface damage.

1.8 WARRANTY

- A. Metal building system manufacturer shall provide a written weathertightness warranty for a maximum of 20 years against leaks in standing roof panels, arising out of or caused by ordinary wear and tear under normal weather and atmospheric conditions.
 - 1. Warranty shall be signed by both the metal roof system manufacturer and the metal roof system installer.
 - 2. Maximum liability of warranty shall be no less than \$0.50 per square foot of roof area.
- B. Roofing and Wall Panel Finish Warranty: Furnish the roofing panel manufacturer's written warranty- covering failure of factory applied exterior finish on metal roof and wall panels within the warranty period. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.
 - 1. Warranty period for factory applied exterior finishes on wall and roof panels is 20 years after the date of substantial completion.
- C. Metal Building System Manufacturer's Certification: Metal building system manufacturer shall submit a signed written Certification 1 week before bid date, stating that the metal roof system manufacturer or approved representative will provide warranties and Inspection and Report Service specified in this specification section.
 - 1. Warranty terms shall be submitted with bid.

PART 2 PRODUCTS

2.1 METAL ROOF AND WALL PANELS

- A. Manufacturer:
 - 1. Behlen Manufacturing Cp.
 - 2. Butler Manufacturing Co.
 - 3. Ceco Buildings Division
 - 4. Star Buildings Devision
 - 5. H.H. Robertson Co.
 - 6. Varco- Pruden Buildings

- B. Standing Seam Metal Roof and Wall Panels and Siding Manufacturer's standard factory-formed standing seam roof panel system designed for mechanical attachment of panels to roof purlins using a concealed clip. Form panels of 24 gage, Grade C, zinc coated steel sheets.
 - 1. Clips: Provide 16 gage panel clips.
 - 2. Cleats: Factory sealed, mechanically seamed cleats formed from 24 gage, Grade C, zinc coated sheets. 1 ½" Standing Seam 16" O.C.
- C. Fasteners: Self-Tapping screws, bolts, nuts, self-locking rivets, self-locking bolts, end-welded studs, and other suitable fasteners designed to withstand design loads.
- D. Flexible Closure Strips: Closed cell, expanded cellular rubber, self-extinguishing flexible closure strips. Cut or premold to match configuration of roofing sheets. Provide closure strips where indicated or necessary to ensure weathertight construction.
- E. Sealing Tape: Pressure sensitive 100 % solids grey polyisobutylene compound sealing tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½" wide and 1/8" thick.
- F. Joint Sealant: One part elastomeric polyurethane, polysulfide, or silicone rubber sealant as recommended by the manufacturer.
- G. Finish: Provide the manufacturer's standard shop-applied galvalume finish to steel roof panels and siding, and related trim accessory elements. For Panels, apply finish coat on exterior facings and manufacturer's standard wash coat on reverse face.

2.2 ACCESSORIES

- A. General: Provide all required flashings, trims, ridge cap, flute closures, etc. to provide complete and finished installation.
- B. Provide all soffit and fascia panels to match roof.

2.3 SOURCE QUALITY CONTROL

- A. Source: Obtain metal wall panels, trim and other accessories from a single manufacturer.
- B. Quality Control: Obtain metal wall panels, trim and other accessories from a manufacturer capable of providing on-site technical support and installation assistance.

PART 3 EXECUTION

3.1 PREPARATION

- A. Miscellaneous Framing: Install furring, angles, subpurlins, and other miscellaneous wall panel support members and anchorage according to metal wall panel manufacturer's recommendations.

3.2 METAL ROOF WALL PANEL INSTALLATION

- A. General: Comply with panel manufacturer's installation instructions including but not limited to special techniques, interface with other work, and integration of systems.

B. Fasten metal roof and wall panels to supports with concealed clips at each standing-seam joint at location, spacing, and using proper fasteners as recommended by panel manufacturer.

3.3 ACCESSORY INSTALLATION

A. General: Install accessories using techniques recommended by manufacturer and which will assure positive anchorage to building and weather tight mounting. Provide for thermal movement. Coordinate installation with flashings and other components.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and the SMACNA "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and install units to true level. Install work with laps, joints, and seams that will be permanently watertight.

3.4 CLEANING

A. Remove temporary coverings and protection of adjacent work areas.

B. Repair or replace any installed products that have been damaged.

C. Clean installed panels in accordance with manufacturer's instructions prior to Owner's acceptance.

D. Remove and lawfully dispose of construction debris from Project site.

3.5 PROTECTION

A. Protect installed product and finish surfaces from damage during construction.

B. Replace in full any metal panel or roof section that becomes damaged during construction.

END OF SECTION 07421 –

**SECTION 07460
EXTERIOR WOOD SIDING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Engineered Tongue and Groove products:
 - 1. Wood Siding

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: sheathing and air infiltration barrier.
- B. Section 06200 - Finish Carpentry: exterior wood trim.
- C. Section 07620 - Sheet Metal Flashing and Trim: flashing, gutters and sheet metal roofing accessories.
- D. Section 07920 - Sealants: field applied sealants.

1.3 REFERENCES

- A. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- B. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- C. Timber Products Inspection, Inc. - PS1-09.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Samples: For each finish product specified, two full-size units of each type of siding and trim indicated for each color, texture and pattern specified.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 15 years experience in development and manufacturing engineered products for exterior use.
- B. Installer Qualifications:
 - 1. Engage an experienced installer who has completed siding installations similar in material, design and extent to that indicated.
- C. Mock-Up: Before installing siding, construct sample wall panels to verify selections made under sample submittals and to demonstrate aesthetic effects

and qualities of materials and installation.

1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store materials in a covered, well ventilated area that is protected from exposure to damaging environmental conditions.
- C. Do not let material become wet during storage. Protect material from ground moisture absorption.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits or 18 percent moisture content whichever is more stringent.
- B. Condition Siding material to local weather conditions for a minimum of 10 days prior to installation.

1.8 WARRANTY

- A. Manufacturer shall provide a 15-year limited product warranty against manufacturing defects.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Regional Manufacturers are encouraged:
- B. Substitutions: As approved by Architect: Contractor must submit substitution to Architect and receive approval prior to bid opening.

2.2 TONGUE & GROOVE SIDING

- A. T&G Siding:
 1. Material: Engineered 7-ply wood construction, full exterior glue bonded, 11/16 inch (17.5 mm) thickness.
 2. Material Surface: Clear Cypress Common Grade Nos 1 and 2
 3. Panel Width: Nominal 6 inches, 5.25 inches (133 mm) exposed face .
 4. Edge Pattern: Flush

1.1 ACCESSORIES

- A. Related Materials: Refer to other sections for related materials.
- B. Nails:
 1. Type: Siding nail, ring or thread shank with blunt point. Minimum 7d to penetrate through sheathing and into stud 3/4 inch (93 mm).

- a. Material: Stainless steel.
 - b. Material: Hot dipped galvanized steel.
- C. Building Paper:
- 1. Type: Asphalt impregnated paper, ASTM D226, 15# Type I.
 - 2. Type: Spun fiber or other code approved moisture barrier.
- D. Drip Caps/ Edges and Flashing:
- 1. Use Drip caps and flashing over doors, windows, other typed of siding, and siding returns.
 - 2. Match Galvalume roof and trim

PART 3 EXECUTION

1.2 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

1.3 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Determine prior to framing layout which corner treatment is to be utilized. Assure a nailable area beyond corners to allow proper nailing of paneling
- D. After framing is completed, exterior wall installation requires building paper applied horizontally, beginning at bottom of wall with 3 inches (76 mm) overlaps.

1.4 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install panels by attaching over solid nailable sheathing, spaced nailable sheathing or to studs.
- C. Install working from the lowest level up to the top of the wall area.
 - 1. Drive nails flush with siding surface, penetrating studs at least 3/4 inch (19 mm).
 - 2. Maintain 1/8 inch (3 mm) spacing at corner boards and trim. Caulk with non-hardening sealant.
 - 3. Maintain 1/4 inch (6 mm) space from panel butt line and flashing.

1.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion

END OF SECTION 07460

**SECTION 07600
FLASHING & SHEET METAL**

PART 1 GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Sealants – Joint Section 07901

1.2 FURNISHED BUT NOT INSTALLED

A. Furnish various trades with flashing and other items of sheetmetal work shown or specified to be built in by them.

1.3 SHOP DRAWINGS

A. Submit complete shop drawings for sheetmetal work to Architect for approval. See Section 01340.

1.4 GUARANTEE

A. All flashing and sheetmetal work shall be included in 5-year guarantee specified under Roofing. This applicator shall furnish guarantee in written form.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Prefinished metal.
- B. Galvanized sheet metal:
 - 1. ASTM A-361, hot dip type, 24 gauge.
 - 2. Solder - ASTM B-32, 50% tin

PART 3 EXECUTION

3.1 INSTALLATION

- A. Counterflashing shall be installed according to figure "A", page 101, SMACNA Manual.
- B. Corners shall be shop fabricated with legs extending each way from a corner a minimum of 18".

C. Roof penetration flashing shall be fabricated and installed using 24-gauge galvanized steel in accord with figure "A", page 121 and figure "A", page 123, SMACNA Manual.

D. Flashing

1. Lengths not to exceed 15 feet.
2. Side laps 6 inches, end laps 10 inches.
3. Adhere joints together with adhesive recommended by manufacturer.
4. Gutters and downspouts to be located per drawings and installed with all accessories per manufacturer's written instructions.

3.2 EXPANSION AND CONTRACTION

A. Make ample provisions for expansion and contraction of all sheetmetal work. See SMACNA Manual.

3.3 WORKMANSHIP

- A. Equal to best standards of practice in modern sheet metal.
- B. Accurately formed to size, shapes and dimensions with all angles and lines in true alignment.
- C. The work shall conform to "Architectural Sheet Metal Manual" as issued by the Sheet Metal and Air Conditioning Contractors' National Assoc., Inc.

END OF SECTION 07600

**SECTION 07901
JOINT SEALANTS**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes joint sealants for the follow locations:
1. Exterior joints in vertical surfaces and nontraffic horizontal surfaces as indicated below:
 - a. Control and expansion joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Perimeter joints between materials listed above and frames of doors and windows.
 2. Exterior joints in horizontal traffic surfaces as indicated below:
 - a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
 - b. Tile control and expansion joints.
 3. Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated below:
 - a. Control and expansion joint on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings.
 - c. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
 - d. Perimeter joints of toilet fixtures.
 4. Interior joints in horizontal traffic surfaces as indicated below:
 - a. Control and expansion joints in tile flooring.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- B. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause not staining or deterioration of joint substrates.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specifications Sections.
- B. Product data from manufacturers for each joint sealant product required.
- 1. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.
- C. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.
- B. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 - 2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F (4.4 deg C).
 - 3. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less or greater than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealants to comply with the following:
 - 1. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing elastomeric sealants that comply with ASTM C 920.
 - 1. Additional Movement Capability: Where additional movement capability is specified in Elastomeric Joint Sealant Data Sheet, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.
- B. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to, the products specified in each Elastomeric Sealant Data Sheet.
- C. Products: Subject to compliance with requirements, provide on of the products specified in each Elastomeric Joint Sealant Data Sheet.

2.3 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips or flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
 - 1. Closed-cell polyethylene form, nonabsorbent to liquid water and gas, nonoffgassing in unruptured state.

2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.

- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
3. Remove laitance and form release agents from concrete.
4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealants bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
 1. Install joint fillers to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

- a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
- D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
- 1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

END OF SECTION 07901

**SECTION 08110
STEEL DOORS AND FRAMES**

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes steel doors and frames.

1.2 SUBMITTALS

- A. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- B. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
 - 1. Indicate coordination of glazing frames and stops with glass and glazing requirements.

1.3 QUALITY ASSURANCE

- A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch spaces between stacked doors to promote air circulation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Steel Doors and Frames:

- a. Amweld Building Products, Inc.
- b. Benchmark Commercial Doors.
- c. Ceco Door Products.
- d. Copco Door Co.
- e. Curries Co.
- f. Deansteel Manufacturing Co.
- g. Fenestra Corp.
- h. Kewanee Corp.
- j. Mesker Door, Inc.
- k. Pioneer Industries.
- m. Republic Builders Products.
- n. Steelcraft.

2.2 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial-quality carbon steel, pickled and oiled, complying with ASTM A 569 (ASTM A 569M).
- B. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 commercial quality, or ASTM A 620 (ASTM A 620M), drawing quality, special killed.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A 526 commercial quality, drawing quality, hot-dip galvanized according to ASTM A 525, with ASTM A 525M coating designation, mill phosphatized.
- D. Supports and Anchors: Fabricated from not less than 0.0478-inch- thick steel sheet; 0.0516-inch- thick galvanized steel where used with galvanized steel frames.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

2.3 DOORS

- A. Steel Doors: Provide 1-3/4-inch- thick doors of materials and ANSI/SDI 100 grades and models or as indicated on Drawings or schedules:
- B. Door Louvers: Provide louvers according to SDI 111C for interior doors where indicated, with blades or baffles formed of 0.0239-inch- thick cold-rolled steel sheet set into minimum 0.0359-inch- thick steel frame.

2.4 FRAMES

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 0.0478-inch- (1.2-mm-) thick cold-rolled steel sheet.
 - 1. Fabricate frames with mitered or coped and continuously welded corners.
 - 2. Form exterior frames from 0.0635-inch- thick galvanized steel sheet.
- B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.
- C. Plaster Guards: Provide minimum 0.0179-inch- thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

2.5 FABRICATION

- A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.
 - 1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:
 - a. Resin-impregnated paper honeycomb.
 - b. Rigid polyurethane conforming to ASTM C 591.
 - c. Rigid polystyrene conforming to ASTM C 578.
 - d. Unitized steel grid.
 - e. Vertical steel stiffeners.
 - 2. Clearances: Not more than 1/8 inch at jambs and heads doors. Not more than 3/4 inch at bottom.
 - a. Fire Doors: Provide clearances according to NFPA 80.
- B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel sheet.
- C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.
- E. Galvanized Steel Doors, Panels, and Frames: For the following locations, fabricate doors, panels, and frames from galvanized steel sheet according to SDI 112. Close top and bottom edges of doors flush as an integral part of door construction or by addition of minimum 0.0635-inch- thick galvanized steel channels, with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.
 - 1. At exterior locations.
- F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

- G. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.
 - 1. Unless otherwise indicated, provide thermal-rated assemblies with U-value rating of 0.41 Btu/sq. ft. x h x deg F or better.
- H. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.
 - 1. For concealed overhead door closers, provide space, cutouts, reinforcing, and provisions for fastening in top rail of doors or head of frames, as applicable.
- J. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- K. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- L. Glazing Stops: Minimum 0.0359-inch- thick steel.

2.6 FINISHES, GENERAL

- A. Apply primers and organic finishes to doors and frames after fabrication.

2.7 GALVANIZED STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces with nonpetroleum solvent so that surfaces are free of oil or other contaminants. After cleaning, apply a conversion coating of the type suited to the organic coating applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
 - 1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.
- B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.
 - 1. Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.
- C. Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats. Apply primer immediately after surface preparation and pretreatment.

PART 3 EXECUTION

3.1 INSTALLATION

- A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
 - 1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
 - 2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
 - 3. At existing concrete or masonry construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
 - 4. In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In steel-stud partitions, attach wall anchors to studs with screws.
- C. Door Installation: Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100.

3.2 ADJUSTING AND CLEANING

- A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION 08110

**SECTION 08211
FLUSH WOOD DOORS**

PART 1 GENERAL

1.1 SUMMARY

- A. Extent and location of each type of flush wood door is indicated on drawings and in schedules.
- B. Types of doors required include the following:
 - 1. Solid core flush wood doors with wood veneer faces.

1.2 SUBMITTALS

- A. Product Data: Door manufacturer's technical data for each type of door, including details of core and edge construction, trim for openings and louvers, and factory-finishing specifications.
- B. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for factory finishing and other pertinent data.
 - 1. For factory-premachined doors, indicate dimensions and locations of cutouts for locksets and other cutouts adjacent to light and louver openings.

1.3 QUALITY ASSURANCE

- A. Quality Standards: Comply with the following standards:
 - 1. AWI Quality Standard: "Architectural Woodwork Quality Standards"; including Section 1300 "Architectural Flush Doors", of Architectural Woodwork Institute (AWI) for grade of door, core construction, finish and other requirements exceeding those of NWWDA quality standard.
- B. Manufacturer: Obtain doors from a single manufacturer.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Complying with requirements of referenced standards and recommendations of NWWDA pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors", as well as with manufacturer's instructions.
- B. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

1.5 PROJECT CONDITIONS

- A. Conditions: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with the following requirements applicable to project's geographical location:
 - 1. Referenced AWI quality standard including Section 100-S-3 "Moisture Content".

1.6 WARRANTY

- A. General: Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under Contract Documents.
- B. Door Manufacturer's Warranty: Submit written agreement in door manufacturer's standard form signed by Manufacturer, Installer, and Constructor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) or that show telegraphing of core construction in face veneers, or do not conform to tolerance limitations of reference quality standards.
 - 1. Warranty shall also include reinstallation which may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
 - 2. Warranty shall be in effect during following period of time after date of Substantial Completion.
 - 3. Solid Core Interior Doors:
 - a. Five years.
- C. Contractor's Responsibilities: Replace or refinish doors where Contractor's work contributed to rejection or voiding of manufacturer's warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering doors which may be incorporated in the work include, but are not limited to, the following:
 - 1. Solid Core Doors with Wood Veneer Faces:
 - a. Algoma Hardwoods, Inc.
 - b. Buell Door Company.
 - c. Cal-Wood Door Div., Timberland Industries, Inc.
 - d. Chappell Door Company.
 - e. Doors, Incorporated.
 - f. Eggers industries, Architectural Door Division.
 - g. Gay Doors, Inc.
 - h. Glen-Mar Door Mfg. Co.
 - i. Graham Manufacturing Corp.
 - j. Ipik Door Co., Inc.
 - k. Mohawk Flush Doors, Inc.
 - l. Weyerhaeuser Company.

2.2 INTERIOR FLUSH WOOD DOORS

- A. Solid Core Doors for Oil Finish: Comply with the following requirements:
1. Faces: Maple, plain sliced.
 2. AWI Grade: Premium.
 3. Construction: PC-7 (Particleboard core, 7-ply).

2.3 FABRICATIONS

- A. Fabricate flush wood doors to produce doors complying with following requirements:
1. In sizes indicated for job-site fitting.
 2. Factory-prefit and premachine doors to fit frame opening sizes indicated with the following uniform clearances and bevels:
 - a. Comply with tolerance requirements of AWI for prefitting. Comply with final hardware schedules and door frame shop drawings and with hardware templates.
 - b. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory premachining.
- B. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of doors required.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine installed door frames prior to hanging door:
1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
 2. Reject door frames with defects.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation see Division-8 "Finish Hardware" Section of these specifications.
- B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and of referenced AWI standard and as indicated.
- C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below. Machine doors for hardware. Seal cut surfaces after fitting and machining.
1. Fitting Clearances for Non-Rated Doors: Provide 1/8" at jambs and heads; 1/16" per leaf at meeting stiles for pairs of doors; and 1/8" from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4" clearance from bottom of door to top of threshold.
 2. Bevel non-rated doors 1/8" in 2" at lock and hinge edges.

D. Field-Finish Doors: Refer to the following for finishing requirements:

1. Division-9 "Painting" Section.

3.3 ADJUSTING AND PROTECTION

- A. Operation: Rehang or replace doors which do not swing or operate freely.
- B. Finished Doors: Refinish or replace doors damaged during installation.
- C. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at time of Substantial Completion.

END OF SECTION 08211

**SECTION 08410
ALUMINUM ENTRANCES AND STOREFRONT**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The following types of aluminum doors and frames are required:
1. Entrance doors (exterior)
 2. Frames for exterior entrances
 3. Frames for exterior glazed panels
 4. Frames for exterior windows

1.2 QUALITY ASSURANCE

- A. Provide entrance doors, storefront, and windows manufactured by a single firm specializing in the production of this type of work.
- B. Drawings are based on one manufacturer's standard aluminum entrance and storefront system. Another standard system of a similar and equivalent nature will be acceptable when differences do not detract from design concept or specified performances. Dimensional changes necessitated by the use of an alternate system shall be coordinated by the Contractor and shall be shown on shop drawings.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide aluminum entrance and storefront assemblies that comply with specified performance characteristics. Each system shall be tested by a recognized testing laboratory or agency in accordance with specified test methods. Provide certified test results.
- B. Thermal Movement: Provide systems capable of withstanding thermal movements resulting from an ambient temperature range of 120 deg. F that could cause a metal surface temperature range of 180 deg. F within the framing system.
- C. Wind Loading: Provide exterior components which have been tested in accordance with ASTM E 330 to withstand the following:
1. Uniform pressure of 20 psf inward and 20 psf outward with a maximum deflection of L/175.
- D. Air Infiltration: Provide framing system with an air infiltration rate of not more than 0.06 CFM per sq. ft. of fixed area (excluding operable door edges) when tested in accordance with ASTM E 283 at an inward test pressure differential of 6.24 psf.
- E. Water Penetration: Provide framing systems with no water penetration (excluding operable door edges) as defined in the test method when tested in accordance with ASTM E 331 at an inward test pressure differential of 6.24 lbf. per sq. ft.
- F. Condensation Resistance: Where framing systems are "thermal-break" construction, provide units tested for thermal performance in accordance with AAMA 1502 showing condensation resistance factor (CRF) of not less than 45.
- G. Aluminum Entrance Transmission Characteristics: Provide entrance doors with jamb and head frames that comply with requirements indicated for transmission characteristics.

1. Air Infiltration: Provide doors with an air infiltration rate of not more than 0.50 CFM for single doors and 1.0 for pairs of doors when tested in accordance with ASTM E 283 at an inward test pressure differential of 1.567 psf.
 2. Condensation Resistance: Provide entrance doors units tested for thermal performance in accordance with AAMA 1502 showing a condensation resistance factor (CFR) of not less than 48.
- H. The metal framing shall hold the glass firmly and yet remain sufficiently flexible to permit movement of the metal and glass caused by deflection due to wind pressure and expansion and contraction resulting from changes in temperatures. Window walls shall be watertight under all design conditions.

1.4 SUBMITTALS

- A. Submit manufacturer's data, recommendations and standard details for aluminum entrances and storefront, including fabrication, finishing, hardware, accessories and other components of the work.
- B. Submit shop drawings for the fabrication and installation of aluminum entrances and storefront, and associated components of the work. Include wall elevations at 1/2" scale, and half-size detail sections of every typical composite member. Show anchors, joint system, expansion provisions and other components not included in manufacturer's standard data. Include glazing details.
- C. Submit samples of manufacturer's standard range of colors for selection.
- D. Submit sample of each required aluminum finish on 12" long extrusions of the alloys to be used for the work. Where color or texture variations are anticipated, include 2 or more units in each set of samples indicating extreme limits of variations.
- E. Certification: Provide certified test results showing that entrance and storefront system have been tested by a recognized testing laboratory or agency and comply with specified performance characteristics.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Check openings by field measurement before fabrication to ensure proper fitting of work; show measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in the work. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit.

PART 2 - PRODUCTS

2.1 BASIS OF DESIGN

1. Kawneer
2. 451-T Front Set
3. Black Anodized
4. Low-E insulated Glass

2.2 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
 5. Amarlite/Arco Metals Co.
 6. Cronstoms Mfg. Inc.
 7. Kawneer Company, Inc.

8. PPG Industries, Inc.
9. Tubelite Div., Indal Inc.
10. United States Aluminum Corp., International Alum. Corp.
11. Vistawall Architectural Products
- 12.

2.3 MATERIALS

- A. Aluminum Members: Provide alloy and temper recommended by the manufacturer for strength, corrosion resistance, and application of required finish; comply with ASTM B 221 for extrusions and ASTM B 209 for sheet or plate.
 1. Provide main extrusions of not less than 0.125" wall thickness.
 2. Provide extruded glazing stops and other applied trim extrusions with minimum wall thickness of 0.062".
- B. Fasteners: Provide fasteners of aluminum, nonmagnetic stainless steel, or other materials warranted by the manufacturer to be noncorrosive and compatible with aluminum components, hardware, anchors and other components.
 1. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125" thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard noncorrosive pressed-in splined grommet nuts.
 2. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For the application of hardware, use fasteners that match the finish of member or hardware being fastened. Provide Phillips flat-head machine screws for exposed fasteners.
- C. Concealed Flashing: Provide 26 gage minimum dead-soft stainless steel, or 0.026" minimum extruded aluminum of alloy and type selected by manufacturer for compatibility with other components.
- D. Brackets and Reinforcements: Where feasible, provide high-strength aluminum brackets and reinforcements; otherwise provide nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A 386.
- E. Concrete/Masonry Inserts: Provide concrete and masonry inserts fabricated from cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A 386.
- F. Compression Weatherstripping: Provide the manufacturer's standard replaceable compressible weatherstripping gaskets of molded neoprene complying with ASTM D 2000 or molded PVC complying with ASTM D 2287.
- G. Sliding Weatherstripping: Provide the manufacturer's standard replaceable weatherstripping of wool, polypropylene, or nylon woven pile, with nylon fabric or aluminum strip backing, complying with AAMA 701.2.
- H. Glass and Glazing Materials: Glass and glazing materials shall comply with requirements of "Glass and Glazing" section of these specifications.
- I. Sealants and Gaskets: Provide sealants and gaskets in the fabrication, assembly and installation of the work, which are recommended and guaranteed by the manufacturer to remain permanently elastic, non-shrinking, nonmigrating and weatherproof.

2.4 COMPONENTS

- A. Storefront Framing System: Provide inside-outside matched resilient storefront framing system with provisions for glass replacement. Shop-fabricate and preassemble frame components where possible.
 - 1. Thermal-Break Construction: Fabricate storefront framing system with integrally concealed, low conductance thermal barrier, located between exterior materials and exposed interior members to eliminate direct metal-to-metal contact.
 - 2. Use manufacturer's standard construction that has been in use for similar projects for period of not less than 3 years.

- B. Stile-And-Rail Type Aluminum Doors:
 - 1. Frame: Provide tubular frame members, fabricated with mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or j-bolts.
 - a. Medium stile (3-1/2" nominal width).
 - b. Wide stile (over 4" width).
 - 2. Glazing: Fabricate doors to facilitate replacement of glass or panels, without disassembly of stiles and rails. Provide snap-on extruded aluminum glazing stops, with exterior stops anchored for non-removal.

- C. Aluminum Windows: Provide window frames to match member sizes, shapes, construction, and color of storefront system.

2.5 HARDWARE

- A. General: Refer to hardware section in Division 8 for requirements for hardware items other than those indicated to be provided by the aluminum entrance manufacturer.

- B. Provide manufacturer's heavy-duty hardware units as indicated, scheduled, or required for operation of each door, including the following items of sizes, number, and type recommended by manufacturer for service required; finish to match door.
 - 1. Offset Pivot Sets: Provide offset pivot assemblies complying with ANSI A156.4, Grade 1; provide exposed parts of cast aluminum alloy; provide an intermediate pivot for doors over 7'-6" high.
 - 2. Center Pivot Sets: Provide center pivot assemblies complying with ANSI A156.4, Grade 1; provide exposed parts of cast aluminum alloy.
 - 3. Overhead Exposed Holders: Provide streamlined type, exposed overhead holders for use on single-acting doors; comply with ANSI A156.8.
 - 4. Door Stop: Provide floor mounted door stop, with integral rubber bumper; comply with ANSI A156.16, Grade 1. Ives No. 444 or approved equal.
 - 5. Keyed Cylinders: Provide mortise type, 5-pin tumbler, outside cylinder units with cast aluminum face; comply with ANSI A156.5, Grade 1.
 - 6. Deadlocks: Provide mortised maximum security type deadlocks, with minimum 1" long pivoted bolt and stainless steel strike box; comply with ANSI A156.5, Grade 1.
 - a. Provide two-point deadlock MS1851S/4015 by Adams Rite or approved equal.
 - 7. Deadlatches: Provide mortise type deadlatch with stainless steel strike box; comply with ANSI A 156.5, Grade 1.
 - a. Provide heavy duty deadlocking latch Series 4710 or approved equal.
 - 8. Lever Handles: Provide cast aluminum alloy inside lever handle units.
 - 9. ADA Operator:
 - a. Provide Dor-O-Matic Senior Swing electromechanical powered door operator with button/push plate operation (exterior button/push plate on free-standing bollards) or approved equal. Refer Specification Section 08710.
 - 10. Flushbolts: Provide standard edge mortised lever extension type flush bolts complying with

ANSI A156.16, for inactive leaves of pairs of doors. Provide flushbolts at both the top and bottom of doors.

11. Push/Pulls:

a. Style V, Kawneer.

12. Thresholds: Provide extruded aluminum threshold in mill finish, complete with anchors and clips, coordinated with pivots and floor-concealed closers.

2.6 FABRICATION

- A. General: Sizes of door and frame units, and profile requirements, are indicated on drawings.
- B. Prefabrication: Before shipment to the project site, complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible. Disassemble components only as necessary for shipment and installation.
- C. Receive the hardware supplied in accordance with the Section 08710 sections, and coordinate with the hardware requirements of this section. Report discrepancies (in writing) to the Contractor.
- D. Cut, reinforce, drill and tap frames and doors as required to receive hardware, except do not drill and tap for surface-mounted items until the time of installation at the project site. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.
- E. Welding: Comply with AWS recommendations; grind exposed welds smooth and restore mechanical finish.
- F. Reinforcing: Install reinforcing as required for hardware and necessary for performance requirements, sag resistance and rigidity.
- G. Dissimilar Metals: Separate dissimilar metals with zinc chromate primer, bituminous paint, or other separator that will prevent corrosion.
- H. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.
- I. Fasteners: Conceal fasteners wherever possible.
- J. Weatherstripping: For exterior doors, provide compression weatherstripping against fixed stops; at other edges, provide sliding weatherstripping retained in adjustable strip mortised into door edge.
 - 1. Provide EPDM or vinyl blade gasket weatherstripping in bottom door rail, adjustable for contact with threshold.
 - 2. At interior doors and other locations without weatherstripping, provide neoprene silencers on stops to prevent metal-to-metal contact.

2.7 FINISHES

- A. Color Anodized Finish: Provide manufacturer's standard multi-coat thermo-cured system, composed of specially formulated primer and fluorocarbon topcoats, complying with AAMA 605.2.
 - 1. Color: To be selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Do not install component parts which are observed to be defective including warped, bowed, dented, abraded and broken members, and including glass with edge damage. Remove and replace members which have been damaged during installation or thereafter before time of acceptance.
2. Do not cut, trim, weld or braze component parts during erection, in a manner which would damage finish, decrease strength, or result in a visual imperfection or a failure in performance of window wall. Return component parts which require alteration to shop for refabrication, if possible, or for replacement by new parts.

B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Provide proper support and anchor securely in place.

1. Separate aluminum and other corrodible metal surfaces from sources of corrosion of electrolytic action at points of contact with other materials. Comply with requirements specified under paragraph "Dissimilar Materials" in the Appendix to AAMA 101-85.

C. Drill and tap frames and doors and apply surface-mounted hardware items. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.

D. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weathertight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.

E. Refer to "Glass and Glazing" section of Division 8 for installation of glass and other panels indicated to be glazed into doors and framing, and not preglazed by manufacturer.

3.2 ADJUSTING

A. Adjust operating hardware to function properly, for smooth operation without binding, and for weathertight closure.

3.3 CLEANING

A. Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings.

B. Clean glass surfaces after installation, complying with requirements contained in the "Glass and Glazing" section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

3.4 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION 08410

**SECTION 08710
FINISH HARDWARE**

PART 1 - GENERAL

1.1 DESCRIPTION

The extent of the hardware is shown on the drawings and in schedules. The required types of hardware include, but are not necessarily limited to, the following:

- A. Hinges
- B. Lock cylinders and keys
- C. Lock and latch sets
- D. Electric strikes
- E. Electromechanical locking systems
- F. Door closers
- G. Kick plates
- H. Door stops
- I. Viewers
- J. Weatherstripping and seals
- K. Thresholds

1.2 QUALITY ASSURANCE

- A. Obtain each kind of hardware from only one manufacturer even though several may be specified as acceptable manufacturers.
- B. The supplier shall be a recognized architectural finish hardware supplier with warehousing facilities who has been furnishing hardware in the project vicinity for a period of not less than 2 years and who is, or who employs, an experienced architectural hardware consultant who is available during the course of the work for consultation about project's hardware requirements with Architect, Owner's Representative, and Contractor.

1.3 SUBMITTALS

- A. Submit manufacturers technical information for each item of hardware. Include whatever information may be necessary to show compliance with requirements.
- B. Submit Aluminum Storefront manufacturers standard catalog of hardware for selection.
- C. Submit final and coordinated hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.
- D. Schedule Content: Organize hardware schedule into "hardware sets" which correspond to the hardware sets in the contract documents indicating complete designations of every item required for each door or opening. Include the following information:
 - 1. Type, style, function, size and finish of each hardware item.
 - 2. Name and manufacturer of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Location of hardware set cross-referenced to indications on drawings both on floor plans and in door and frame schedule.
 - 5. Explanation of abbreviations, symbols and codes contained in schedule.

6. Mounting locations for hardware.
- E. Keying Schedule: Submit separate detailed schedule indicating that the Owner's final instructions on keying of locks has been fulfilled.

1.4 JOB CONDITIONS

- A. Coordination: Coordinate hardware with other work. Tag each item or package separately, with identification related to the final hardware schedule, and include basic installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.
- B. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check the shop drawings of such other work to confirm that adequate provisions are made for the proper installation of hardware.

PART 2 - PRODUCTS

2.1 MATERIALS AND FABRICATIONS

- A. General:
 1. Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation of operation of door movement as shown.
 2. Fasteners: Provide hardware manufactured to conform to published templates and prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws except as specifically indicated.
 3. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including surfaces to receive painted finish.
 4. Provide concealed fasteners for hardware units which are exposed when door is closed, unless standard units of type specified are available with concealed fasteners.
- B. Hinges, Butts and Pivots:
 1. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
 2. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.
 3. Hinge Pins: Unless indicated otherwise, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins.
 - b. Non-Ferrous Hinges: Stainless steel pins.
 - c. Exterior Doors: Non-removable pins.
 - d. Interior Doors: Non-rising pins.
 - e. Tips:
 - (1) Flat button and matching plug.
 - (2) Hospital type.
 4. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 80" or less in height and one additional hinge for each 16" of additional height.
- C. Door Silencers: GJ-64 or GJ-65 installed on each door frame. Apply three for single doors and four for pairs of doors.

- D. Door Closers: Sweep period of closer shall be adjusted so from open position of 70 degrees, door will take at least 3 seconds to move to a point 3 inches from latch.

2.2 KEYING

- A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.
- B. Standard System: Provide master key system for project.
- C. Review the keying system with the Owner and provide the type(s) required.
- D. Cylinders:
 - 1. Equip locks with manufacturer's standard 6-pin tumbler cylinders.
 - 2. Metals: Construct lock cylinders parts from brass/bronze, stainless steel or nickel silver.
- E. Comply with Owner's instructions for masterkeying and provide individual change key for each lock which is not designated to be keyed alike with a group of related locks. Permanently inscribed each key with number or lock that identifies cylinder manufacturer key symbol, and notation "DO NOT DUPLICATE".
- F. Key Material: Provide keys of nickel silver only.
- G. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system.
- H. Deliver keys to Owner.

2.3 LOCKS, LATCHES AND BOLTS

Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.

- A. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.
- B. Provide roller type strikes where recommended by manufacturer of the latch and lock units.

2.4 DOOR TRIM UNITS

- A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units, with either machine screws or self-tapping screws.
- B. Fabricate protection plates (armor, kick or mop) not more than 1-1/2" less than door width on stop side and not more than 1/2" less than door width on pull side, x the height indicated. Metal kick plates shall be steel with finish to match adjacent hardware, .050" (U.S. 18 ga.).

2.5 WEATHERSTRIPPING

Provide continuous weatherstripping at each edge of every exterior door leaf. Provide type, sizes and profiles scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application

indicated.

2.6 HARDWARE FINISHES

- A. Provide matching finishes for hardware units at each door or opening to the greatest extent possible, unless indicated otherwise. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lockset (or push-pull units if not latch-lock sets) for color and texture.
- B. The general finish shall be stainless steel satin US32D.
- C. Door closer to be painted aluminum (BHMA 689).
- D. Thresholds and weatherstripping shall be mill finish aluminum.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hardware Mounting Heights: Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware" or "Custom Steel Doors and Frames" by the Door and Hardware Institute, except or otherwise specifically indicated or required to comply with governing regulations.
- B. Requirements for the Handicapped:
 - 1. Handles shall be mounted 42 inches above finish floor.
 - 2. Doors leading to dangerous areas such as mechanical equipment rooms, loading platforms, electrical rooms, stairs, fire escapes, shall identified by the use of curled handles or knobs.
 - 3. Thresholds shall be flush with the floor or beveled gradually from both sides. Thresholds shall not have raised stops.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. Set thresholds for exterior doors in full bed of sealant.

3.2 ADJUST AND CLEAN

- A. Adjust and check each operating item of hardware and each door to ensure proper operation and function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy and make a final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.3 SCHEDULE

- A. Unless specifically noted otherwise in the specifications, the products listed by name are not intended to exclude the products of other manufacturers of equal quality for the purpose stated. The manufacturer's names listed are for a guide as to type required and all such hardware furnished shall meet these standards as far as quality, weight, finish and design.
- B. If hardware or an item of hardware for a particular location is not listed or described, it shall be furnished and shall be as specified for similar locations. Omissions and discrepancies shall be brought to the attention of the Owner's Representative immediately.
- C. Hardware sets are to meet requirements set forth in the 2000 International Building Code.
- D. Hardware Schedule to be verified with Owner. Hardware to be provided as follows:

Hardware Set No. 1

Double Aluminum Storefront Exterior Doors:

Basic hardware	Selected from the manufactures standard hardware (hinges, weatherstripping, threshold, flush bolt, lockset, etc.)
Closer	Corbin/Ruswin DC 3000
Lockset/panic device	Selected from the manufactures standard hardware (exit devices)

Hardware Set No. 2

Double Solid Core Interior Egress Door:

1-1/2 pair butt hinges	Hager BB1191NRP (4-1/2 x 4-1/2)
Lockset/panic device	Von Duprin 22NL
Closer	Corbin/Ruswin DC3000

Hardware Set No. 3

Single Solid Core Interior Door:

1-1/2 pair butt hinges	Hager BB1191NRP (4-1/2 x 4-1/2)
Lockset	Corbin/Ruswin ML2003
Stop	Rockwood 470

Hardware Set No. 4

Single Solid Core Interior Doors:

1-1/2 pair butt hinges	Hager BB1191NRP (4-1/2 x 4-1/2)
Closer	Corbin/Ruswin DC3000
Kickplates	Rockwood 10" high x door width – 1 ½"
Stop	Rockwood 470
Pull	Rockwood BF258
Push	Rockwood 70C

Hardware Set No. 5

Double Solid Core Interior Door:

1-1/2 pair butt hinges	Hager BB1191NRP (4-1/2 x 4-1/2)
Lockset	Corbin/Ruswin ML2003
Flushbolt	Rockwood 550

Hardware Set No. 6

Hollow Metal Exterior Door:

1-1/2 pair butt hinges

Lockset/panic device

Closer

Threshold

Door Bottom

Weatherstripping`

Hager BB1191NRP (4-1/2 x 4-1/2)

Von Duprin 22NL

Corbin/Ruswin DC3000

National Guard 4241E

National Guard 200N

National Guard 160S

Hardware Set No. 7

Solid Core Interior Double Door:

Dummy Set

Ball Catch

Corbin/Ruswin ML2050

Rockwood 911

Hardware Set No. 8

Solid Core Interior Doors:

1-1/2 pair butt hinges

Passage set

Hager BB1191NRP (4-1/2 x 4-1/2)

Corbin/Ruswin ML2010

Hardware Set No. 9

Solid Core Interior Doors:

1-1/2 pair butt hinges

Passage set

Stop

Hager BB1191NRP (4-1/2 x 4-1/2)

Corbin/Ruswin ML2010

Rockwood 470

END OF SECTION 08710

**SECTION 08800
GLASS AND GLAZING**

PART 1 - GENERAL

1.1 DESCRIPTION

The types of glass and glazing required include, but are not necessarily limited to, the following:

- A. Glass panels in aluminum windows
- B. Glass panels in aluminum storefront
- C. Glass vision panel in interior wood door
- D. Glass panels in interior sidelights
- E. Mirrors

1.2 QUALITY ASSURANCE

- A. Manufacturers: Firms with not less than 5 years of successful experience in production of types of materials required.
- B. Standards:
 - 1. Flat Glass Marketing Association Glazing Manual and Sealant Manual
 - 2. American Society for Testing and Materials
 - 3. Flat Glass Jobbers Association
 - 4. American National Standards Institute
 - 5. Consumer Products Safety Commission
- C. Provide safety glass where indicated or required by authorities having jurisdiction. Provide type of products indicated which comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.

1.3 SUBMITTALS

Submit manufacturer's specifications, recommendations and installation instructions for each type of glass, glazing sealant and compound, gasket and accessory material required. Provide documentation that setting blocks and spacers are compatible with sealant.

1.4 JOB CONDITIONS

Do not proceed with glass installation and glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes. Install glazing sealants only when temperatures are in middle third of manufacturer's recommended installation temperature range.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Glass: Provide products of type indicated and complying with the following requirements:
 - 1. Tempered Glass: ¼" thick, clear float glass.
 - 2. Insulating glass: 1" insulated units clear interior and Low E exterior (tempered as required by governing code).

3. Glass for vision panels in interior doors: tempered glass (refer A.1 above)
- B. Mirrors:
1. Glass: FS DD-G-451, Type I, Class 1, Quality Q2, ¼" thick clear plate.
 2. Coating: Silver backing, copper protective coating and paint coating complying with CS 27.
- C. Glazing: Provide products of type indicated and complying with the following requirements:
1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates under conditions of installation and service, as demonstrated by testing and field experience.
 2. Suitability: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.
 3. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.
 4. Colors: Provide color of exposed sealants as selected by Architect or Owner's Representative from manufacturer's standard colors.
- D. Setting Materials:
1. General:
 - a. The use of nonskinning compound, nonresilient type preformed sealers and preformed impregnated type gaskets will not be permitted.
 - b. Metal sash putty will not be permitted.
 - c. Materials used with aluminum frames shall match the frame color, be nonstaining and not require painting.
 2. Glazing Sealants:
 - a. For heel bead on exterior glazing and full bed on exterior door lights provide polysulfide-based, 2-part elastomeric sealant: Type M; Grade NS; Class 25; Uses NT, M, G, A, and, as applicable to uses indicated, O.
 - b. For interior and exterior face beads on exterior glazing provide one-part acid curing silicone rubber elastomeric sealant: Type S; Grade NS; Class 25; Uses NT, G, A.
 - c. For interior glazing only provide emulsion of acrylic, with or without latex rubber modification; compounded specifically for glazing; nonhardening, non-staining and nonbleeding.
 - d. For structural and butt glazing provide one-part acid curing silicone rubber elastomeric sealant: Type S; Grade NS; Class 25; Uses NT, G, A.
 3. Glazing Gaskets:
 - a. Structural Rubber Glazing Gaskets: Neoprene extrusions fabricated into frames with molded corner units and zipper lock strips; comply with ASTM C 542.
 - b. Molded Neoprene Glazing Gaskets: Molded or extruded neoprene gaskets complying with ASTM C 864 of the profile and hardness required for watertight construction.
 - c. Interior use only:
 - (1) Polyvinyl Chloride Glazing Gaskets: Extruded, flexible PVC gaskets of the profile and hardness shown, or as required for watertight construction; comply with ASTM D 2287.
 - (2) Cellular Neoprene Compression Seals: Extruded or molded, closed cell, integral-skinned neoprene of profile required to maintain watertight seal; comply with ASTM C 509, Type II, black.
 - (3)

E. Miscellaneous Glazing Materials:

1. Channel Cleaner: Use type compound recommended by sealant manufacturer for channel surfaces to be cleaned.
2. Channel Primer/Sealer: Provide type of primer or sealer recommended by sealant manufacturer for application of sealant to channel surfaces.
3. Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.
4. Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.
5. Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.
6. Compressible Filler Rod: Closed-cell or waterproof-jacketed foam of synthetic rubber or plastic foam, tested for compatibility with specified glazing sealants, of 5 to 10 psi compression strength (25% deflection), as recommended by sealant manufacturers for use in glazing channel to prevent sealant exudation from channel.

PART 3 - EXECUTION

3.1 PERFORMANCE REQUIREMENTS

- A. Each installation must withstand normal temperature changes, wind loading, and impact loading (for operating sash and doors) without failure including loss of breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.
- B. Protect glass from edge damage during handling, installation and operation of building systems and equipment.
- C. Contractor is responsible for correct glass size for each opening, within tolerances and necessary dimensions established.

3.2 INSTALLATION

A. General and Standards:

1. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw, and bow oriented in the same direction as other pieces.
2. Inspect each piece of glass immediately before installation and eliminate pieces which have observable edge damage or face imperfections.
3. Do not attempt to cut, seam, nip or abrade glass which is tempered, heat strengthened, or coated.

B. Preparation of Substrate:

1. Clean the glazing channel, or other framing members to receive glass immediately before glazing. Remove coatings which are not firmly bonded to the substrate. Remove lacquer from metal surfaces where elastomeric sealants are used. Do not clean with detergents.
2. Apply primer or sealer to joint surfaces where recommended by sealant manufacturer.

C. Sealant/Compound Glazing:

1. Install setting blocks of proper size in sill rabbet; locate at one-fourth of glass width, measured from each jamb. Set blocks in thin course of the heel-bead compound, if heel bead is to be installed.

2. Provide spacers inside and out, and of proper size and spacing, for glass sizes larger than 50 united inches, except where pre-shimmed tape or gaskets are used for glazing. Provide 1/8" minimum bite of spacers on glass, and use thickness equal to sealant width, except with butyl rubber sealant tape use thickness 1/32" less than final compressed thickness of tape.
3. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in channels at heel of jambs and heads (do not leave voids in sill channels), except as otherwise indicated. In general, voids or filler rods are required for glazing plastics, and for insulating glass more than 1/2" thick, and for laminated or colored glass (tinted, heat-absorbing and coated) larger than 75 united inches, and for other glass more than 9/32" thick or larger than 120 united inches.
4. Force sealants into channel to eliminate air pockets and voids and to ensure complete "wetting" and bond of sealant to glass and channel surfaces.
5. Tool exposed surfaces of glazing sealants and compounds to provide a substantial "wash" away from glass.
6. Clean and trim excess glazing materials from glass and stops or frames promptly after installation, and eliminate stains and discolorations.

D. Gaskets and Tapes:

1. Miter cut and bond ends together at corners where gaskets are used for channel glazing so that gaskets will not pull away from corners and result in voids or leaks in glazing system.
2. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on the opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when subjected to dynamic movement. Anchor gasket to stop with matching ribs or by proven adhesives, including embedment of gasket tail in cured heel bead.

3.3 CURE AND PROTECTION

- A. Cure glazing sealants and compounds in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.
- B. Protect exterior glass from breakage immediately upon installation by attachment of crossed streamers to framing held away from glass. Do not apply markers directly on surfaces of glass. Remove applied labels from glass surfaces immediately after glass installation.
- C. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during the construction period, including pieces damaged through natural causes, accidents and vandalism.

3.4 CLEANING GLASS

- A. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.
- B. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.
- C. Clean glass and plastics in accordance with manufacturer's recommendations.
- D. Clean plastics in accordance with manufacturer's recommendations.

- E. Wash and polish glass on both faces not more than 4 days prior to Owner's acceptance of the work in each area. Comply with glass manufacturer's recommendations.

END OF SECTION 08800

**SECTION 09250
GYPSUM WALLBOARD SYSTEMS**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section describes requirements for gypsum wallboard systems and associated items. The types of work include, but are not limited to, the following:
1. Gypsum drywall applied to wood framing and furring.
 2. Gypsum backing boards for application of other finishes.
 3. Drywall finishing (joint tape-and-compound treatment).
- B. Fire Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance rating has been determined per ASTM E 119 by a testing and inspecting organization acceptable to authorities having jurisdiction. Provide fire-resistance-rated assemblies identical to those indicated by reference to GA File No's. in GA-600 "Fire Resistance Design Manual" or to design designations in U.L. "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.
- C. Concrete Backer Board: Requirements are described in Section 09390 - Cementitious Backing Board.
- D. Thermal Insulation: Requirements are described in Section 07210 - Building Insulation.
- E. Acoustical Sealant: Requirements are described in Section 07900 - Sealants.

1.2 SUBMITTALS

- A. Furnish manufacturer's certification that materials meet or exceed specification requirements.
- B. Furnish manufacturer's printed instructions for installation of the assemblies.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.
- B. Comply with GA-216 "Application and Finishing of Gypsum Board" by Gypsum Association.
- C. Allowable Construction Tolerances: 1/8" offsets between planes of board faces, and 1/4" in 8'-0" for plumb, level, warp and bow.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.

- C. Handle gypsum boards to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.5 SITE CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. Minimum Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously thereafter until drying is complete.
- C. Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Gypsum Wallboard:
 - 1. Regular board:
 - a. ASTM C 36.
 - b. Thickness: As indicated, or if not indicated, in 5/8" thicknesses to comply with ASTM C840 for application and support spacing indicated.
 - c. Edges: Tapered.
 - d. Provide foil-backed where indicated.
 - 2. Fire-rated board (Type X):
 - a. ASTM C 36.
 - b. Thickness: 5/8"
 - c. Edges: Tapered
- B. Fasteners:
 - 1. Screws for sheet metal application:
 - a. Self-drilling, self-tapping, bugle head, for use with power driven tool.
 - b. Single layer and base layer application: Type S, 1" long.
 - c. Double layer screw attachment: Type S, 1-5/8" long.
 - 2. Screws for attaching to wood framing:
 - a. Self-drilling, self-tapping, bugle head, for use with power driven tool.
 - b. Single layer and base layer application: Type W, 1-1/4".
 - c. Double layer adhesively laminated: Type G, 1-1/2".
- C. Joint Treatment Materials: Provide materials complying with ASTM C 475, ASTM C 840 and recommendations of manufacturer's of both gypsum board and joint treatment materials for the application indicated.
 - 1. Joint tape: Paper reinforcing tape.
 - 2. Joint compound: Ready-mixed vinyl-type for interior use.
 - a. Taping compound for first coat over fasteners and flanges of corner beads and edge trim.
 - b. Topping compound formulated for fill (second) and finish (third) coats.

- D. Laminating Adhesive:
 - 1. Manufacturer's recommendation for laminating multiple-ply application.
- E. Spot Grout: ASTM C 475, setting-type joint compound of type recommended for spot grouting hollow metal door frames.
- F. Sound Attenuation Blankets:
 - 1. ASTM C 665, Type I
 - 2. Thickness: 2"
 - 3. 3-1/2" batt insulation may be used at Contractor's option.
- G. Accessories:
 - 1. Corner beads: U.S.G. Perf-A-Bead or an approved equal.
 - 2. Edge trim: U.S.G. No. 200 series or an approved equal.
 - 3. Control joints: U.S.G. 093 or an approved equal.
- H. Drywall Texture-Walls:
 - 1. Provide "Wall Spray Texture" as manufactured by Gold Bond or approved equal.
 - 2. Texture: Light orange peel finish
- I. Drywall Texture-Ceilings:
 - 1. Provide "Spray Quick" texture as manufactured by Gold Bond or approved equal.
 - 2. Texture: Light orange peel finish

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. Use wallboard of maximum lengths to minimize end joints.
 - 2. Stagger end joints when they occur.
 - 3. Locate end joints as far as possible from center of wall or ceiling.
 - 4. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.
 - 5. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar construction to comply with details indicated and with recommendations of gypsum board manufacturer, or if none available, with "Gypsum Construction Handbook" published by United States Gypsum Co.
 - 6. Isolate steel framing from building structure to prevent transfer of loading imposed by structural movement, at locations indicated below to comply with details shown on Drawings:
 - a. Where edges of suspended ceilings abut building structure horizontally at ceiling perimeters or penetrations of structural elements.
 - b. Where partitions and wall framing abuts overhead structure. Provide slip or cushioned type joints as detailed to attain lateral support and avoid axial loading.
 - 7. Do not bridge building expansion and control joints with steel framing or furring members; independently frame both sides of joints with framing or furring members or as indicated.
- B. Framing:
 - 1. Wall systems:
 - a. Erect non-load-bearing partitions with wood studs. Space studs at 16" o.c. and interconnect end studs in adjoining partitions with screws at 24" o.c.

- b. Secure floor and ceiling runners to structure at 24" o.c. maximum.
 - c. Studs shall be installed in continuous lengths with no splicing in lengths up to 16' for 3-5/8" studs and 16' for 6" studs.
2. Framed openings:
- a. Ceiling openings: Install auxiliary framing at termination of drywall work, and at openings for light fixtures, air supply exhaust, access panels and similar work, as required for support of both the drywall construction and other work indicated for support thereon. Intermediate structural members, although not a part of the building structural system, shall be provided for attachment and suspension of support members.
 - b. Wall openings: Provide frames for openings required for doors, pass-throughs, access panels, fire dampers, ducts, cable trays and similar work. Install runner channel section cut 24" longer than rough-opening above and below framed opening. Bend, nest and secure runner ends to studs. Prepared openings above ceilings in fire-rated work shall conform to SMACNA and UL requirements.
 - (1) Space jack studs same as partition studs and screw to runner tracks above and below.
 - (2) Install two (2) studs at each jamb of each opening over 2'-0" wide.
- C. Wallboard:
- 1. Do not install imperfect, damaged or damp boards. Butt boards together for a tight contact at edges and end with not more than 1/16" open space between boards. Do not place tapered edges against cut edges or ends.
 - 2. Ceilings - single ply: Apply wallboard with long dimension at right angles to framing.
 - 3. Walls - single ply: Apply wallboard with long dimension at right angles to furring or framing, unless ceiling height is greater than 8'-2".
 - a. When installing wallboard horizontally attach upper wallboard first.
 - b. Stagger end joints to occur on different framing members on opposite sides of partition.
 - 4. Walls - two ply: Apply first ply so that a minimum of end joints and least amount of joint treatment occur in finish ply. Bond second ply with adhesive recommended by manufacturer.
 - 5. Attachment:
 - a. Fastening shall conform to ANSI A97.1.
 - b. Use only screw fasteners.
 - c. Space screws 12" o.c. along ends and edges and field of wallboard at walls and ceilings.
 - d. Drive screws with positive clutch electric screwdriver.
- D. Spot grout hollow metal door frames for solid core wood doors, hollow metal doors and doors over 32 inches wide. Apply spot grout at each jamb anchor clip just before inserting board into frame.
- E. Where feasible, install accessories using the same fasteners to anchor flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.
- F. Control Joints:
- 1. Locate wall control joints at approximately 20' on centers. Do not locate wall control joints within 8" of a corner or opening.
 - 2. Locate control joints at each jamb of every door on both sides of the partition. Extend joint from door head to top of the partition.
 - 3. Door jamb control joints may serve as the required wall control joints if it lies within the approximately 20' spacing as described above.
- G. Taping and Finishing Joints:
- 1. Taping and embedding joints:
 - a. Apply compound in thin uniform layer to joints and angles to be reinforced.

- b. Apply reinforcing tape immediately.
 - c. Center tape over joint, and seat tape into compound.
 - d. Leave approximately 1/64 in. to 1/32 in. compound under tape to provide bond.
 - e. Apply skim coat immediately following tape embedment but not to function as fill or second coat.
 - f. Fold tape and embed in angles to provide true angle.
 - g. Dry embedding coat prior to application of fill coat.
2. Filling:
- a. Apply joint compound over embedding coat.
 - b. Fill taper flush with surface.
 - c. Apply fill coat to cover tape.
 - d. Feather out fill coat 2 inches beyond tape and previous joint compound line.
 - e. Joints with no taper: Feather out at least 4 in. on either side of tape.
 - f. Do not apply fill coat on interior angles.
 - g. Allow fill coat to dry prior to application of finish coat.
3. Finishing:
- a. Spread joint compound evenly over and 2 inches beyond fill coat on all joints.
 - b. Feather to smooth, uniform finish.
 - c. Apply finish coat to taped angles to cover tape and taping compound.
 - d. Sand final application of compound to provide surface ready for decoration.
- H. Filling and finishing depressions:
- 1. Apply joint compound as first coat to fastener depressions.
 - 2. Apply at least two additional coats of compound after first coat is dry.
 - 3. Leave filled and finished depressions level with plane of surface.
- I. Finishing Beads and Trim:
- 1. First fill coat:
 - a. Apply joint compound to bead and trim.
 - b. Feather out from ground to plane of the surface.
 - c. Dry compound prior to application of second fill coat.
 - 2. Second fill coat:
 - a. Apply joint compound in same manner as first fill coat.
 - b. Extend beyond first coat onto face of wallboard.
 - c. Dry compound prior to application of finish coat.
 - 3. Finish coat:
 - a. Apply joint compound to bead and trim.
 - b. Extend beyond second fill coat.
 - c. Feather finish coat from ground to plane of surface.
- J. Drywall Textures:
- 1. Surface Preparation and Primer: Prepare and prime drywall and other surfaces in accordance with texture finish manufacturer's instructions. Apply primer to all surfaces to achieve texture finish.
 - a. Primer shall be Glidden Y-5700 or approved equal.
 - 2. Texture Application: Mix and apply texture to drywall in accordance with manufacturer's instructions to produce a uniform texture without starved spots or other evidence of thin application, and free of application patterns.
 - 3. Remove any texture droppings or overspray from door frames, windows and other adjoining work.

3.3 REPAIR AND PROTECTION

A. Screw Pop:

1. Repair screw pop by driving new screw approximately 1-1/2" from screw pop and reseal screw.
2. When face paper is punctured drive new screw approximately 1-1/2" from defective fastening and remove defective fastening.
3. Fill damaged surface with compound.

B. Ridging:

1. Do not repair ridging until condition has fully developed: approximately six months after installation or one heating season.
2. Sand ridges to reinforcing tape without cutting through tape.
3. Fill concave areas on both sides of ridge with topping compound.
4. After fill is dry, blend in topping compound over repaired area.

C. Fill cracks with compound and finish smooth and flush.

D. Provide protection and maintain conditions in a manner which ensures gypsum wallboard construction being without damage or deterioration at time of Substantial Completion.

END OF SECTION 09250

**SECTION 09900
PAINTING**

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
- B. Paint exposed surfaces whether or not colors are designated in "schedules," except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
 - 1. Painting includes field painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

1.2 DEFINITIONS

- A. "Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's technical information, label analysis, and application instructions for each material proposed for use.
 - 1. List each material and cross-reference the specific coating and finish system and application. Identify each material by the manufacturer's catalog number and general classification.
- B. Samples for initial color selection in the form of manufacturer's color charts.
 - 1. After color selection, the Architect will furnish color chips for surfaces to be coated.
- C. Samples for verification purposes: Provide samples of selected color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate. Define each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
 - 1. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
 - 2. Submit samples on the following substrates for the Architect's review of color and texture only:
 - a. Concrete: Provide two 4inchsquare samples for each color and finish.
 - b. Stained or Natural Wood: Provide two 4 by 8 inch samples of natural and stained wood finish on actual wood surfaces.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label.
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Federal Specification number, if applicable.
 - 4. Manufacture's stock number and date of manufacturing.
 - 5. Contents by volume, for pigment and vehicle constituents.
 - 6. Thinning instructions.
 - 7. Application instructions.
 - 8. Color name and number.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

- A. Apply water based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F and 90 deg F.
- B. Apply solvent thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F and 95 deg F.
- C. Do not apply paint in snow, rain, fog, or mist, when the relative humidity exceeds 85 percent, at temperatures less than 5 deg F above the dew point, or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following or equal:
 - 1. The Sherwin-Williams Company (S-W)
 - 2. PPG Industries, Pittsburgh Paints (Pittsburgh)
 - 3. Pratt and Lambert (P&L)

2.2 PAINTING SYSTEMS

- A. Exterior Metal:

Surfaces - Exterior steel, iron and galvanized items such as roof top equipment, metal frames, for exterior doors, exterior hollow metal doors, uninsulated piping systems, and other exterior ferrous metal not otherwise specified.

Primer for Bare Steel & Iron - Red Metal Primer

Primer for Galvanized Metal - Galvanized Metal Primer

Finish - Exterior Alkyd Enamel (2 coats)

B. Interior Wood: (Semi-gloss finish)

Surfaces - Closet and storage shelving

Primer - Alkyd enamel undercoater

Finish - Interior Latex Enamel (2 coats)

C. Interior Wood: (Varnish Finish)

Surfaces - Millwork, doors and trim

Finish - Satin wood varnish systems (3 coats)

Stain as selected by Architect

D. Gypsum Board: (Flat Latex)

Surfaces - Ceilings

Primer - 1 coat mixture Sherwin-Williams 1 gal.

Promar filler to 1 gal. Promar latex flat wall paint

Finish - 2 coats Promar latex flat wall paint

E. Gypsum Board: (Semi-gloss)

Surfaces - Walls

Spot prime cemented and taped joints with Promar latex wall primer and

Primer - 1 coat Sherwin-Williams Promar latex wall paint

Finish - Sherwin-Williams Promar Alkyd Semi-Gloss Enamel

F. Gypsum Board: (Epoxy)

Surfaces - Walls and Ceilings

Spot prime cemented and taped joints with Promar latex wall primer and

Primer - 1 coat Sherwin-Williams Promar latex wall paint

Finish - 2 coats Sherwin-Williams water based epoxy B70W Series

G. Interior Metal:

Surfaces - Metal Doors and frames; Grilles, Registers

Spot prime cemented and taped joints with Promar latex wall primer and

Primer for Bare Steel & Iron - Red Metal Primer

Primer for Galvanized Metal - Galvanized Metal Primer

Finish - Egg Shell Alkyd System (2 coats)

H. Interior Concrete: (Epoxy)

Surfaces - Walls

Primer - 1 coat Sherwin-Williams PrepRite Masonry Primer

Finish - 2 coats Tile - Promar 200 interior Alkyd Gloss

Surfaces - Floors (Existing)

Etching - H&C Etching Solutions

Finish - 2 coats Sherwin Williams Porch and Floor Enamel (Water-Based)

I. Interior Masonry Blocks: (Semi-gloss)

Surfaces - Walls

Primer - 1 coat Sherwin-Williams Promar Block Filler

Finish - 2 coats Sherwin-Williams Promar 200

J. Exterior Wood

Surfaces - Walls and Soffits

Primer - 1 coat Sherwin-Williams Woodscapes Exterior Acrylic Solid Color House Stain

Finish - 1 coats Sherwin-Williams Woodscapes Exterior Acrylic Solid Color House Stain

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint. Do not begin paint application until unsatisfactory conditions have been corrected.
1. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

3.2 PREPARATION

- A. General Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
1. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- B. Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer's instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing of problems anticipated with using the specified finish coat material with substrates primed by others.
 2. Cementitious Materials: Prepare concrete, concrete masonry block surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, and rinse; allow to dry and vacuum before painting.
 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

- a. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - b. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
 - c. When transparent finish is required, back prime with spar varnish.
 - d. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
4. Ferrous Metals: Clean no galvanized ferrous metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
- C. Materials Preparation: Carefully mix and prepare paint materials in accordance with manufacturer's directions.
- 1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
 - 3. Use only thinners approved by the paint manufacturer, and only within recommended limits.
- D. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
- D. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.
- E. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.
- F. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.
- G. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

- H. Transparent (Clear) Finishes: Use multiple coats to produce a glass smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
 - 1. Provide satin finish for final coats.
- I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

3.4 CLEANING

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. Upon completion of painting, clean glass and paint spattered surfaces. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

- A. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- B. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.
 - 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 09900

**SECTION 10155
TOILET COMPARTMENTS**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The type of toilet compartments required include the following:
1. Floor mounted and overhead braced.

1.2 SUBMITTALS

- A. Product data for each toilet accessory item specified, including construction details relative to materials, dimensions, gages, profiles, mounting method, specified options, and finishes.
- B. Setting drawings where cutouts are required in other work, including templates, substrate preparation instructions, and directions for preparing cutouts and installing anchorage devices.
- C. Maintenance instructions including replaceable parts and service recommendations.

1.3 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish accessory manufacturers' standard inserts and anchoring devices that must be set in concrete or built into masonry. Coordinate delivery with other work to avoid delay.
- B. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas.

1.4 PROJECT CONDITIONS

- A. Coordination: Coordinate accessory locations, installation, and sequencing with other work to avoid interference with and ensure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.
- B. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from all possible damage. Inspect cartons at time of delivery and advise carrier of any damage immediately.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Basis of Design Product: The design for the toilet compartments are based on the floor mounted partitions by Accurate Partitions Corporation. Subject to compliance with requirements, provide the named product or an equivalent substitute by one of the following:
1. American Sanitary Partition Co.
 2. Knickerbocker Partitions Corp.
 3. Sanymetal
- B. Doors and Panels: Shall be 1" thick and fabricated from tension-leveled, cold rolled commercial quality 22 gauge galvanealed steel, bonded to sound deadening honeycomb core.
- C. Pilasters: Shall be 1-1/4" thick, 82" high, and fabricated from tension-leveled, cold rolled

commercial quality 22 gauge galvanealed steel, bonded to sound deadening honeycomb core.

- D. Material: Doors, panels and pilasters shall be manufactured with a honeycomb core bonded to the steel with a non-toxic adhesive to ensure solid construction and sound attenuation. All components shall be assembled with a continuous roll formed interlocking crown molding, with the corners braised and ground smooth.
- E. Finish: Doors, panels, and pilasters shall be power washed and phosphate treated for maximum finish color adhesion. All components shall be finished with a hybrid epoxy-polyester powder, electrostatically applied to ensure uniform thickness and baked to cure.
- F. Color: Shall be selected from Accurate's full range of standard designer colors.
- G. Door Hardware: Shall be cam-action hinges that permit door to remain at desired position when not in use. Hinges, one-piece strike and keeper and coat hook shall be chromium plated Zamac to resist corrosion. Hinges, strike and keeper shall be attached with tamper resistant barrel nuts and shoulder screws. Concealed latch assembly shall allow for emergency access. Doors for handicapped compartments shall be supplied with ADA paddle handles.
- H. Mounting Hardware: Chrome plated Zamac stirrup brackets shall be used to mount panels and pilasters. Mounting hardware shall be secured with tamper resistant screws.
- I. Construction Design: Compartments shall be floor anchored with one-piece mounting fork and include Integral leveling bolt to provide proper height adjustment. Floor anchoring system shall be concealed with a type 304 stainless steel trim shoe with a #4 finish. Aluminum headrail with anti-grip profile shall provide overhead bracing and span all compartments and brace the end pilaster to the back wall.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install toilet partitions secure, rigid, plumb and level in accordance with manufacturer's instructions.
- B. Maintain manufacturer's recommended spacing between wall and panels and between wall and pilasters.
- C. Equip each door with hinges, concealed lock, coat hook and bumper, door strike and keeper. Outswing doors shall have a door pull and wall bumper.

3.2 ADJUSTING AND CLEANING

- A. Adjust operating parts to work easily, smoothly and correctly.
- B. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- C. Adjust hinges to position in swing doors at a 30 degree angle to pilasters and out swing doors to a fully closed position.

END OF SECTION 10155

**SECTION 10400
IDENTIFYING DEVICES**

PART 1 GENERAL

1.1 SUBMITTALS

- A. Shop Drawings: Provide Complete shop drawings for approval, instructions, mounting procedures, templates and rubbings where required.
- B. Samples: Provide one full size sample of each type letter specified, showing style and finish.

PART 2 PRODUCTS

2.1 ROOM IDENTIFICATION

- A. Furnish and install Best HC ADA System for each space identified on floor plan. HC 300A restrooms and HC 300E all other spaces. Braille and tactile faces.
- B. Install 60" A.F.F. to center of sign

PART 3 EXECUTION

3.1 INSTALLATION

- A. All identifying devices shall be installed in accordance with manufacturer's instructions and layouts provided by the architect.

END OF SECTION 10350

**SECTION 10425
SIGNS**

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following types of signs:
 - 1. Dimensional letters and numbers.
 - 2. Cast metal plaque.
 - 3. Cast metal letters.

1.2 SUBMITTALS

- A. Product data: Include manufacturer's construction details relative to materials, dimensions, of individual components, profiles, and finishes for each type of sign required.
- B. Shop Drawings; Provide shop drawings for fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, reinforcement, accessories, layout, and installation details.
 - 1. Provide message list for each sign required, including large-scale details of wording and layout of lettering.
 - 2. For signs supported by or anchored to permanent construction, provide setting drawings, templates, and directions for installation of anchor bolts and other anchors to be installed as a unit of Work in other Sections.
 - 3. Furnish full-size spacing templates for individually mounted dimensional letters and numbers.
 - 4. Furnish full-size rubbings for metal plaques.

1.3 QUALITY ASSURANCE

- A. Single-Source Responsibility: For each separate type of sign required, obtain signs from one source from a single manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following
 - 1. Manufacturers of Cast Plaques/ Cast Letters:
 - a. Andco Industries Corp.
 - b. A.R.K. Ramos Manufacturing Company, Inc.
 - c. Best Manufacturing Co.
 - d. Gemini, Inc.
 - e. Lake Shore Markers.
 - f. Metal Arts, Division of L & H Manufacturing Co.
 - g. OMC Industries, Inc.
 - h. The Southwell Company.

2.2 MATERIALS

- A. Brass Castings: Provide brass castings, brass alloy OMC CDA406, complying with the requirements of ASTM B 584.
 - 1. Plaque:
 - a. Size: 24" x 24"
 - b. Letter style: Helvetica
 - c. Letters: Approximately 350

2. Letters:
 - a. Size 10"
 - b. Letter style: Helvetica Medium
 - c. Letters: 57

- B. Fasteners: Use concealed fasteners fabricated from metals that are not corrosive to the sign material and mounting surface.
- C. Anchors and Inserts: Use nonferrous metal or hot-dipped galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for dilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.3 CAST METAL PLAQUES

- A. Plaques: Castings shall be free from pits, scale, sand holes, or other defects. Comply with requirements specified for metal, border style, background texture, and finish and with requirements shown for thickness, size, shape, and copy. Hand-tool and buff borders and raised copy to produce the manufacturer's standard satin polished finish. Refer to "Finish" article for other finish requirements.
 1. Metal: Brass.
 2. Border Style: Projected bevel.
 3. Background Texture: Manufacturer's standard pebble texture.
 4. Background Finish: Provide dark statuary finish to comply with the requirement specified for brass finishes, except provide background texture specified above in lieu of mechanical finish indicated.

2.4 FINISHES

- A. Color Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected by the Architect from the manufacturer's standards.
- B. Metal Finishes: Comply with NAAMM "Metal Finishes Manual" for finish designations and applications recommendations.
- C. Finishes:
 1. Natural Satin Finish: Clear Organic Coating
 2. Statuary Finish: Chemical Finish: Clear Organic Coating

PART 3 EXECUTION

3.1 INSTALLATION

- A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instruction.
 1. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
- B. Cast Metal Plaque:
 1. Concealed Mounting: Mount inserting threaded studs into tapped lugs on the back of the plaque. Set in predrilled holes filled with quick-setting cement.

3.2 CLEANING AND PROTECTION

- A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION 10425

**SECTION 10520
FIRE EXTINGUISHERS AND ACCESSORIES**

PART 1 - GENERAL

1.1 DESCRIPTION

The types of items to be installed include, but are not limited to, the following:

- A. Portable fire extinguishers
- B. Semi-recessed mounting cabinets
- C. Wall mounting brackets

1.2 QUALITY ASSURANCE

- A. Provide portable fire extinguishers and accessories by a single manufacturer.
- B. Products shall be manufactured by J. L. Industries or approved equal.
- C. New portable fire extinguishers shall comply with applicable UL standard and shall be labeled by UL.

1.3 SUBMITTALS

Submit manufacturer's catalog and technical data along with rough-in dimensions and installation instructions.

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHERS

- A. Provide J.L. Industries Cosmic 6E multi-purpose dry chemical or approved equal in quantities and locations acceptable to fire marshal. Final selection to meet all applicable codes.

2.2 MOUNTING CABINETS

- A. Provide J.L. Industries Ambassador 1017F12 semi-recessed type cabinet with color epoxy coated trim and door or approved equal.

2.3 MOUNTING BRACKETS

- A. Provide J.L. Industries standard mounting bracket or approved equal for use in the Kitchen.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
- B. Where exact locations of fire extinguishers and cabinets are not indicated, locate as directed by Owner's Representative.

END OF SECTION 10520

**SECTION 10800
TOILET AND BATH ACCESSORIES**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The type of toilet accessories required include the following:
1. Paper Towel Dispenser and Waste Receptacle
 2. Liquid Soap Dispenser
 3. Grab Bars
 4. Toilet Tissue Dispensers
 5. Sanitary Napkin Vendor
 6. Sanitary Napkin Disposal

1.2 SUBMITTALS

- A. Product data for each toilet accessory item specified, including construction details relative to materials, dimensions, gages, profiles, mounting method, specified options, and finishes.
- B. Setting drawings where cutouts are required in other work, including templates, substrate preparation instructions, and directions for preparing cutouts and installing anchorage devices.
- C. Maintenance instructions including replaceable parts and service recommendations.

1.3 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish accessory manufacturers' standard inserts and anchoring devices that must be set in concrete or built into masonry. Coordinate delivery with other work to avoid delay.
- B. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas.

1.4 PROJECT CONDITIONS

- A. Coordination: Coordinate accessory locations, installation, and sequencing with other work to avoid interference with and ensure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide toilet accessories by one of the following:
1. Bobrick Washroom Equipment, Inc. or approved equal
 2. American Specialties, Inc.

2.2 MATERIALS, GENERAL

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 0.034-inch (22-gage) minimum thickness.
- B. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- C. Fasteners: Screws, bolts, and other devices of same material as accessory unit, or of galvanized steel where concealed.

2.3 PAPER TOWEL DISPENSERS

- A. Semi-Recessed Paper Towel Dispensers: Fabricate of stainless steel with hinged front equipped with tumbler lockset.
 - 1. Capacity: One 8" wide x 8" diameter standard roll.
- B. Basis of Design- Bobrick B-38032

2.4 LIQUID SOAP DISPENSER

- A. Surface-Mounted Liquid Soap Dispenser-
- B. Basis of Design- Bobrick B-26607

2.5 GRAB BARS

- A. Stainless Steel Type: Provide grab bars with wall thickness not less than 0.05 inch (18 gage) and as follows:
 - 1. Mounting: Concealed, Manufacturer's standard flanges and anchorages.
 - 2. Mounting: Exposed, manufacturer's standard flanges and anchorages.
 - 3. Clearance: 1-1/2-inch clearance between wall surface and inside face of bar.
 - 4. Gripping Surfaces: Smooth, satin finish.
 - 5. Gripping Surfaces: Manufacturer's standard nonslip texture.
 - 6. Heavy-Duty Size: Outside diameter of 1-1/2 inches.
- B. Basis of Design- Bobrick B-5806

2.5 TOILET TISSUE DISPENSERS

- A. Dual-Roll Dispenser: Size to accommodate standard roll.
- B. Basis of Design Bobrick B-2888

2.5 NAPKIN/TAMPON VENDOR

- A. Semi-Recessed Napkin/ Tampon Vendor
- B. Basis of Design- Bobrick B-370634

2.5 PARTITION MOUNTED NAPKIN DISPOSAL

- A. Partition Mounted Sanitary Napkin Disposal
- B. Basis of Design- Bobrick B-345

2.6 FABRICATION

- A. General: Only a maximum 1-1/2-inch-diameter, unobtrusive stamped manufacturer logo is permitted on exposed face of toilet or bath accessory units. On either interior surface not exposed to view or back surface, provide additional identification by either a printed, waterproof label or a stamped nameplate,

indicating manufacturer's name and product model number.

- B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
- C. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors or access panels with full-length, stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.
- D. Keys: Provide universal keys for access to toilet accessory units requiring internal access for servicing, resupply, etc. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install toilet accessory units according to manufacturers' instructions, using fasteners appropriate to substrate as recommended by unit manufacturer. Install units plumb and level, firmly anchored in locations and at heights indicated.
- B. Install grab bars to withstand a downward load of at least 250 lb, complying with ASTM F 446.

3.2 ADJUSTING AND CLEANING

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces strictly according to manufacturer's recommendation after removing temporary labels and protective coatings.

3.3 SCHEDULE OF ACCESSORIES

- A. Product selections and manufacturer's product numbers are shown on the drawings.
- B. Obtain final approval of the selection of all toilet accessories with Owner or Owner's Representative prior to ordering or installation.

END OF SECTION 10800

PART I - GENERAL

1.01 WORK INCLUDED:

- A. Water Service Piping
- B. Hot and Cold Water Piping
- C. Temperature and Pressure (T&P) Relief Piping
- D. Valves
- E. Shock Suppressors

1.02 RELATED WORK:

- A. Section 23 01 00 Operation and Maintenance of HVAC Systems
- B. Section 23 07 00 HVAC Insulation
- C. Section 22 40 00 Plumbing Fixtures

1.03 SUBMITTALS:

- A. Submit manufacturer's data sheets on valves and shock suppressors.
- B. Submit list of piping products to be used and state their manufacturers, classes or types, and other applicable data.
- C. Submit Shop Drawings of shock suppressors layout proposed.
- D. Submit record drawings indicating actual location and routing of installed piping.
- E. Submit certificate of completion of chlorination.

PART 2 - PRODUCTS

2.01 PIPING:

- A. For underground water service piping outside building to water meter:
 - 1. ASTM B88 type as indicated on drawings hard copper tubing with wrought copper fittings and joints made with 95-5 solder.
 - 2. Thickness Class 50, cement lined, seal coated, hub and spigot type ductile iron with joints made with rubber compression rings manufactured for the purpose. (Optional)
- B. For underground water piping inside building and to five feet outside building:
 - 1. 1" and smaller - ASTM B88 type as indicated on drawings soft copper tubing with no fittings or joints permitted under slab. Make connections above slab using wrought copper fittings and 95-5 solder.
 - 2. 1-1/4" and larger - ASTM B88 type as indicated on drawings hard copper tubing with wrought copper fittings and joints make with Sil-Fos Solder (15% silver content).

- C. For exposed piping in toilet rooms and other finished areas, use chrome plated brass pipe with threaded fittings.
- D. For above ground water and T&P relief piping inside building, use ASTM B88 type as indicated on drawings hard copper tubing with wrought copper fittings and joints made with 95-5 solder.
- E. Solder containing lead shall not be used on potable water systems.

2.02 VALVES:

- A. Provide valves with suitable materials including discs, plugs, balls, gaskets, linings, and lubricants for the service, temperature, and pressure to which they will be exposed. Furnish with solder or screwed connections.
- B. Gate Valves: Bronze, non-rising stem, inside screw, double wedge.
- C. Globe or Angle Valves: Bronze, rising stem, inside screw, renewable composition disc.
- D. Check Valves: Bronze with swing disc.
- E. Standard Hose Bibbs (HB): Bronze, replaceable disc, hose thread outlet with vacuum breaker.
- F. Freeze Proof Hose Bibbs (FPHB): 3/4" anti-siphon non-freeze type with bronze casing and box with loose key handle. Furnish for proper wall thickness.
- G. Garbage Can Wash Valve (GCWV): 3/4" non-freeze mixing type with hot and cold water connections, bronze casing and deep box with loose key handle. Provide vacuum breaker and furnish for proper wall thickness. Wade W-8606-HC.
- H. Pressure Reducing Valves (PRV): Bronze with 125 psig inlet pressure and 50 psig adjustable outlet pressure. Furnish same size as pipe.
- I. Temperature and Pressure Relief Valve (T&P): Bronze with test lever. Size to handle BTU/hr. rating of water heater.

2.03 SHOCK SUPPRESSORS:

- A. Provide Wade "Shockstops" of all stainless steel construction with welded nested bellows and pre-charged with nitrogen. Size and locate in accordance with PDI-WH201.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Ream pipes and tubing and thoroughly clean inside and outside prior to connecting.

3.02 INSTALLATION:

- A. Slope water piping minimum of 1 inch in 40 feet and arrange to drain at all low points.
- B. Bury all underground outside piping a minimum of 3 feet below finished grade.
- C. Use electrically insulating type connections for joining dissimilar metals such as brass valves or adapters or insulating couplings.

- D. Use proper adapters for screwed valves to copper piping.
- E. Use teflon tape or other approved joint compound to connect threaded pipe.
- F. Connect to T&P relief valve and extend full size to approved discharge point.
- G. Where pipe passes through finished wall, ceiling, or floor, provide chrome plated escutcheon plate securely anchored to pipe. Install pipe so that no threads show.
- H. Arrange with local utility for water tap and meter installation. Pay all costs to establish water services.
- I. Install gate valve to isolate or shut-off equipment or branch lines. Use globe valves where adjustable flow or throttling is required.
- J. Install hose bibbs centerline, 2 feet above floor or grade. Install garbage can wash valve 4 feet above floor or drain.
- K. Provide PRV to limit maximum static pressure at plumbing fixtures to 70 psig. Submit pressure data taken at different times as approved or install PRV at service connection or in building. Provide PRV at other separate fixtures when shown on Drawings.
- L. Make provisions necessary to prevent cross connections with sanitary drainage system or other non-potable sources. Provide reduced pressure type backflow preventers when required.
- M. Provide thermostatic mixing valve equal to Symmons 7-225 at all sinks, lavatories, tubs and showers.

3.03 TESTING:

- A. Before concealing or insulating, test domestic water piping and prove leak free. Subject system to minimum hydrostatic pressure of 100 psig and hold for one hour.

3.04 STERILIZATION:

- A. After tests have been successfully completed, thoroughly flush and sterilize the completed domestic water system in accordance with AWWA C601.
- B. Flush entire system after sterilization until residual chlorine content is no greater than 0.2 parts per million.
- C. Chlorinate only when the building is unoccupied.

END OF SECTION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Underground drain and vent piping
- B. Above ground drain, waste, and vent piping
- C. Sanitary sewer service piping
- D. Condensation drip and overflow piping
- E. Cleanouts
- F. Floor Drains
- G. Manholes

1.02 RELATED WORK:

- A. Section 23 01 00 Operation and Maintenance of HVAC Systems
- B. Section 22 40 00 Plumbing Fixtures

1.03 SUBMITTALS:

- A. Submit manufacturer's data sheets on cleanouts and floor drains.
- B. Submit list of piping products to be used for the listed services and state their manufacturers, classes or types, and other applicable data.
- C. Submit record drawings indicating actual location and routing of installed piping.
- D. Submit Shop Drawings on manholes indicating manufactured items, reinforcing steel requirements, etc.

PART 2 - PRODUCTS

2.01 PIPING:

- A. Underground drain and vent piping inside building and to five feet outside building:
 - 1. Service Weight (SV) cast iron hub and spigot pipe and fittings, coated inside and outside with coal tar varnish, and joints made with compression type molded neoprene gaskets.
 - 2. Schedule 40 PVC
- B. Above ground drain and vent piping:
 - 1. Service Weight (SV) cast iron "No-Hub" pipe and fittings, and joints made with standard weight stainless steel/neoprene couplings.
- C. Waste arms for lavatories, sinks, and urinals:

1. DWV copper pipe with cast brass adapters and wrought copper fittings and joints made with 50-50 solder.
 2. Schedule 40 galvanized steel pipe with screwed fittings (optional).
 3. Schedule 40 PVC
- D. Underground sewer piping outside building to sewer main:
1. Service Weight (SV) cast iron hub and spigot pipe and fittings, coated inside and outside with coal tar varnish, and joints made with compression type molded neoprene gaskets.
 2. Vitrified slat glaze clay hub and spigot pipe fittings and joints made with compression type molded neoprene gaskets. (Optional)
 3. Schedule 40 PVC.
- E. Condensation drip and overflow piping: solvent-cement weld.
- F. Acid Resistant Piping:
1. Schedule 40 polypropylene with mechanical joint couplings equal to orion type II "Blueline" for above ground piping and "Brownline" for below ground piping.

2.02 CLEANOUTS:

- A. Provide cleanouts compatible with type of drain piping to which it is connected. Provide covers compatible with type of floor or wall finish with consideration given to traffic conditions. Make cleanouts same size as pipe through 4 inches.
- B. Floor Cleanout (FCO): Cast iron with tapered brass plug, threaded adjustable housing, and round nickel bronze scoriated top. J. R. Smith 4111 series or equal.
- C. Cleanout to Grade (COTG) Same as FCO except with heavy duty cast iron scoriated top. Set COTG in 18-inch diameter concrete base 4 inches thick and flush with finished grade.
- D. Wall Cleanout (WCO): Cast iron with tapered brass plug and stainless steel access cover. Wade W-8450 or equal.
- E. Stack cleanout (SCO): Formed with cleanout tee or other approved fitting of cast iron with brass plug and stainless steel access cover. Wade W-460 or equal.

2.03 FLOOR DRAINS:

- A. Standard Floor Drain (FD): Lacquered cast iron body with flange, clamping collar with seepage openings, and adjustable square satin bronze strainer. Floor drains are 2 inches unless shown otherwise.
- B. Safe Waste Drain (SWD): Same As FD except provide funnel of same material as strainer.
- C. Drain with Backwater Valve (BWV): Same as FD except furnish with integral BWV Wade No. 31 or equal. Provide for all drains installed below grade or where drain flooding may occur.
- D. Garbage Can Wash Drain: Cast iron with flange, sediment bucket, and heavy duty hinged grate. Wade W-1740 or equal.

2.04 TRAPS:

- A. Provide water seal trap for all connections to drain, waste, and vent system. Provide deep seal traps for all floor drains. Floor drain traps to be cast iron, varnish coated inside and out and compatible with type of drain pipe to which it is connected. Provide Proset trapguard for specified drain.
- B. Provide traps enameled on inside for janitor's sinks.
- C. Provide chrome plated brass traps for plumbing fixtures in finished spaces.

2.05 MANHOLES:

- A. Provide heavy-duty cast iron covers with mounting ring suitable for supporting truck traffic.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Swab pipes and clean joints and fittings inside and out prior to making connections. Use proper lubricants on compression gaskets.

3.02 INSTALLATION:

- A. Unless indicated otherwise on the Drawings, slope horizontal drain and vent piping in accordance with the following:

<u>Size</u>	<u>Minimum Slope</u>
3" and smaller	1/4" per foot
4" and larger	1/8" per foot

- B. Slope condensation drip and overflow piping a minimum of 1/16" per foot. Extend to approved discharge point.
- C. Bury all underground outside sewer pipe a minimum of 2 feet from finished grade.
- D. On condensate drain for each cooling coil, provide deep seal trap of same material as drip piping. Make trap water seal 2" greater than rated static pressure of fan associated with cooling coil but no less than 3" deep.
- E. Form manholes with steel reinforced concrete to required depths. Provide one inch steel ladder rungs 12 inches on center firmly set in concrete. Provide heavy cast iron cover in mounting ring formed in concrete with steel re-bar around ring.
- F. Make floor drains and cleanouts free from leaks. Lubricate cleanout plugs with mixture of graphite and linseed oil and do not over tighten.
- G. Arrange with local utility for sewer tap and pay all costs to establish sewer service.

3.03 TESTING:

- A. Before concealing, test drain, waste, and vent system and prove leak free:
 1. Water test - Subject system to at least 10 feet of hydrostatic head for 30 minutes.
 2. Air test - Subject system to at least 5 psig air pressure for 30 minutes. (Optional)

END OF SECTION

ELECTRIC WATER HEATERS- COMMERCIAL GRADE**ELECTRIC WATER HEATERS – COMMERCIAL GRADE
SECTION 22 33 30****PART 1 - GENERAL****1.01 WORK INCLUDED:**

- A. Electric storage water heaters
- B. Electric point of use water heaters
- C. Electric instantaneous water heater

1.02 RELATED WORK:

- A. Section 23 01 00 General Mechanical Requirements
- B. Section 22 11 16 Domestic Water Piping System

1.03 SUBMITTALS:

- A. Submit Manufacturer's Data Sheets on POU water heaters, boiler, storage tank, and thermostatic mixing valve.
- B. Submit Shop Drawings required for rough in coordination.

1.04 QUALITY ASSURANCE:

- A. Furnish products fully approved and certified by UL. Comply with ASME code for both fired and unfired pressure vessels. Comply with ASHRAE Standard 90 on standby losses.

PART 2 - PRODUCTS**2.01 ELECTRIC WATER HEATERS (Commercial Grade):**

- A. Furnish with insulated and jacketed glass lined steel tank for working pressure of 125 PSI. Include anode rod.
- B. Provide immersion type electric heating elements with stainless steel sheath and automatic temperature control set at 105°F. Include high limit cut off and low water cut off.
- C. Unit shall be pre-wired with immersion thermostat, magnetic contactor, 120V pre-wired control circuit with transformer.

2.02 ELECTRIC POINT OF USE WATER HEATERS:

- A. Furnish with insulated and jacketed glass lined steel tank for working pressure of 150 PSI. Include anode rod.
- B. Provide immersion type electric heating elements with automatic temperature control set at 105°F. Include high limit cut off.

- C. Unit shall be pre-wired with surface mounted thermostat, 120V control circuit with transformer.

2.03 ELECTRIC INSTANTANEOUS WATER HEATER:

- A. The heater shall be an in-line non-storage type with cast aluminum alloy casing and plastic housing with stainless steel parts.
- B. Provide flow switch and flow control.
- C. Unit shall be U.L. approved.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Provide temperature and pressure relief valve properly sized for Btu capacity ratings. Pipe to floor drain or janitors sink.
- B. Adjust controls for storage water temperatures stated herein.

END OF SECTION

PLUMBING FIXTURES
SECTION 22 40 00

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Plumbing fixtures, trim, and accessories.

1.02 RELATED WORK:

- A. Section 23 01 00 Operation and Maintenance of HVAC Systems
- B. Section 22 13 16 Sanitary Waste and Vent Piping
- C. Section 22 11 16 Domestic Water Piping

1.03 SUBMITTALS:

- A. Submit Manufacturer's Data Sheets including rough-in requirements and installation instructions for all fixtures and accessories.

PART 2 - PRODUCTS

2.01 PLUMBING FIXTURES:

- A. Provide only new fixtures and trim free from blemishes, scratches, discoloration or other flaws.
- B. Provide fixtures and trim as scheduled on the Drawings. Include all mounting accessories and incidental items for a complete installation.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Verify rough-in arrangement and clean mounting surfaces prior to installation.
- B. Provide sturdy support for all fixtures and proper anchors for rough-in connections. Provide additional wood blocking as required for adequate support.

3.02 INSTALLATION:

- A. Install each fixture with proper water seal trap. Furnish water closets and urinals with integral traps. Provide chrome plated brass traps, waste arms, tailpieces, and wall escutcheon plates, for all other fixtures set above floor level.
- B. Provide each fixture with an accessible chrome plated brass supply with screw driver or loose key stop, reducer, and escutcheon.
- C. Furnish drinking fountains, urinals, water closets, and other wall mounted fixtures with heavy duty approved wall carriers designed for the purpose and compatible with wall construction and thickness.
- D. Provide concealed lavatory support equal to J. R. Smith model 0700 with floor mount, rectangular 1' x

3" "Pro-Set" upright, 4" square base welded to upright adjustable sleeve, thread concealed arm. Assemblies shall be covered with manufacturer's acid resistant coating. Miscellaneous parts shall be coated with high quality enamel paint. Locate support inside plumbing wall or chase. Provide manufacturer's arm extension adapters as required to extend through stud or concrete wall. See manufacturer for adapter sizes for the appropriate wall.

E. Install fixtures at the following mounting heights above finished floor unless indicated otherwise:

1. Water Closet:

Standard	15" to top of seat
Handicapped	17"-19" to top of seat
 2. Urinal:

Standard	22" to top of rim
Handicapped	17" to top of rim
 3. Wall Hung Lavatory:

Standard	31" to top of rim
Handicapped	34" to top of rim
 4. Drinking Fountain:

Standard	40" to top of water orifice
Handicapped	36" to top of water orifice
- * Flush Controls shall be 44" max. AFF.

F. Where fixtures come in contact with wall, counter, or other mounting surface, caulk with fine dental plaster or approved material for clean waterproof joint.

3.03 FIXTURE ROUGH-IN SCHEDULE:

A. Provide rough-in piping connections for the following minimum sizes or as required for particular fixture.

		Waste	Vent	Cold Water	Hot Water
1.	Water Closets (Flush Valve)	3"	2"	1"	----
2.	Urinals (Flush Valve)	2"	1-1/2"	3/4"	----
3.	Lavatories & Small Sinks	1-1/2"	1-1/4"	1/2"	1/2"
4.	Janitor's Sinks	3"	1-1/2"	1/2"	1/2"
5.	Drinking Fountains	1-1/4"	1-1/4"	1/2"	----
6.	Shower Mixing Valves	ee Floor----- Drain		1/2"	1/2"
7.	Bathtubs	1-1/2"	1-1/4"	1/2"	1/2"

8.	Utility Boxes (Washing Mach.)	2"	1-1/4"	1/2"	1/2"
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- B. Where lavatories are supplied with cold water only, connect cold water supply to both hot and cold connections of lavatory fitting.

3.04 ADJUSTING:

- A. Adjust each flush valve for minimum water usage to obtain specified performance and for minimum noise.

END OF SECTION

GENERAL MECHANICAL REQUIREMENTS
SECTION 23 01 00

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Comply with the Conditions of the Contract, General and Supplementary Conditions, and any other applicable requirements contained herein or issued under separate cover.
- B. Perform other work related to or necessary for the mechanical installation in accordance with the applicable Specification Division or Section contained herein.
- C. In Mechanical Specification Sections, items under "RELATED WORK" are listed for convenience only and are not guaranteed to be a complete listing of all applicable work.

1.02 CODES, REGULATIONS AND STANDARDS:

- A. Comply with the latest edition of applicable codes including the following:
 - 1. International Building Code
 - 2. Arkansas State Plumbing Code
 - 3. Arkansas State Gas Code
 - 4. Life Safety Code (NFPA 101)
 - 5. National Electrical Code (NFPA 70)
 - 6. Arkansas State Fire Prevention Code
 - 7. Arkansas Gas Pipeline Code
 - 8. Arkansas Energy Code
- B. Comply with applicable Regulations as amended, including the following:
 - 1. Arkansas State Department of Health Regulations
 - 2. Current Arkansas Rules and Regulations for Energy Efficiency Standards for New Building Construction
 - 3. Arkansas Department of Labor Regulations
 - 4. Occupational Safety and Health Act (OSHA)
 - 5. Utility Company Regulations and Requirements
 - 6. Other State and Federal Laws and Regulations
 - 7. Local Ordinances
- C. Furnish products and perform installation conforming to the latest accepted Standards published by the following organizations:
 - 1. Underwriter's Laboratories, Inc. (UL)
 - 2. National Fire Protection Association (NFPA)
 - 3. National Electrical Manufacturer's Association (NEMA)
 - 4. American Society of Testing Materials (ASTM)
 - 5. American National Standards Institute (ANSI)
 - 6. Air Movement and Control Association (AMCA)
 - 7. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
 - 8. American Society of Mechanical Engineers (ASME)
 - 9. American Water Works Association (AWWA)

10. American Refrigeration Institute (ARI)
11. American Gas Association (AGA)
12. Cast Iron Soil Pipe Institute (CISPI)
13. Midwest Insulation Contractors Association (MICA)
14. Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)
15. Insurance Service Office (ISO)
16. Factory Insurance Association (FIA)
17. Factory Mutual (FM)
18. Institute of Boiler and Radiator Manufacturers (IBR)
19. National Environmental Balancing Bureau (NEBB)
20. Associated Air Balance Council (AABC)
21. American Society of Sanitary Engineers (ASSE)
22. Plumbing and Drainage Institution (PDI)
23. National Sanitation Foundation (NSF)

- D. In case of discrepancy or conflict between Codes, Regulations, Standards, Drawings and/or Specifications, the requirement yielding the higher(est) quality of work shall govern.

1.03 ADMINISTRATIVE FEES:

- A. Obtain and maintain all necessary licenses, permits and inspections and pay all fees including taxes and penalties, if any, required by the Administrative Authority. Refundable deposits will be paid by the Contractor.

1.04 PRE-CONSTRUCTION SUBMITTALS:

- A. Submit for approval, Manufacturer's technical data sheets including performance specifications for all equipment and air devices shown on the schedules. Also provide data on all system accessories and all materials. Include all piping, ductwork and insulation materials. Accessories to be submitted on shall include valves and all piping accessories, and all duct accessories including extractors, turning vanes, control dampers and balancing dampers.
- B. Submit for approval, Contractor's original Shop Drawings of all assemblies of manufactured items including control diagrams. Submit all items called out in individual sections, in addition to those called for in this section.
- C. Indicate all pertinent dimensions on scale drawings necessary for clarity and or coordination of the installation between trades.
- D. Provide complete electrical data and wiring diagrams.
- E. Make Submittals on all work contained in Division 15, Mechanical at one time except by special permission.
- F. Bind Submittals in durable cover(s) with contents conveniently organized and properly indexed with index tabs.
- G. Obtain approval on product manufacturers not specifically named prior to making submittals.
- H. Each Mechanical Section contains a listing of required Submittals only for convenience.
- I. Submit for approval a schedule of nameplates and manufacturer's data sheets and Shop Drawings on special supports and seals.
- J. Provide performance data on all substituted items to demonstrate equality to those scheduled. Include all sound level, rpm, velocity and other data as it is applicable.

- K. Submit proposed changes in ducts, pipes or equipment lay out before ordering or fabrication as stated below under "Intent".

1.05 INTENT:

- A. It is intended that the Contractor provide a complete and operating mechanical system including all incidental items, and connections necessary for proper operation or customarily included even though each and every item may not be indicated.
- B. The Drawings indicate the general layout requirements for equipment, fixtures, piping, ductwork, etc. Final layout will be governed by actual field conditions with all measurements verified at the site. Contractor shall verify that all equipment, ducts, pipes and all other components will fit in the space provided before fabrication or ordering. Contractor shall submit any proposed changes to the Engineer for approval before ordering or fabrication.
- C. It is intended that the mechanical installation be safe, reliable, energy efficient, and easily maintained with adequate provisions allowed for access to equipment.
- D. It is intended that the mechanical system operate quietly with noise levels below the criteria recommended for the application by ASHRAE. Provide corrective action as required to reduce objectionable noise or vibration.

PART 2 - PRODUCTS

2.01 PRODUCT REQUIREMENTS:

- A. Furnish only new standard products of a manufacturer regularly engaged in the production of said products.
- B. Support all products by service organizations with adequate spare parts inventory and personnel located reasonably close to the site.
- C. Where multiple units of the same type or class of products are required, provide all units of the same manufacturer.

2.02 PRODUCT HANDLING:

- A. Store products in the original containers and shelter in a suitable environment at an approved location. Make readily accessible for inspections and inventory accounting.

2.03 PRODUCT SUBSTITUTIONS:

- A. For products specified by generic reference standard, select any product meeting such standard.
- B. For products specified by naming one or more products or manufacturers, select any named. Submit request, in writing, for substitution of any product or manufacturer not specifically named and obtain approval at least five working days prior to bid date.
- C. Provide all information required to support claim of "equality" of product proposed for substitution. Substitutions will be considered only if equivalent in quality, efficiency, performance, size, weight, reliability, appearance, and ease of maintenance to the specified product or manufacturer.
- D. Where approved product substitutions alter the design, space requirements, electrical requirements, connections, or etc., include all work necessary to provide a complete installation of quality equal to or better than that which would have been achieved with products or manufacturers as specified.

2.04 MECHANICAL IDENTIFICATION:

- A. Identify each major component as to manufacturer's name, address, model number, serial number, and pertinent ratings on a durable plate attached to the component in a conspicuous place.
- B. Identify each major component as it is named on the Drawings or referred to herein with engraved nameplates made from laminated plastic sheets.
 - 1. Furnish with white letters on black background except for other color coded requirements.
 - 2. Provide appropriate size nameplates with information easily readable.
 - 3. Submit for approval, a schedule of nameplates to be affixed to each major component.
 - 4. Attach nameplates with approved adhesive on factory baked enameled surfaces only. Attach nameplates with proper screws on field painted and all other surfaces.
- C. Identify outdoor underground lines with continuous strip of plastic utility marker tape as manufactured by Seton stating at regular intervals "CAUTION (state utility) PIPE BELOW." Install one foot directly above pipe before backfilling to grade.

2.05 ANCHORS:

- A. Size anchors for minimum safety factor of two times recommended load. Use only corrosion resistant materials.
- B. In new concrete, use malleable iron inserts set prior to pouring concrete.
- C. In existing concrete or solid masonry, use Phillips "Redhead" expansion shields or Elcen self drilling expansion shields. Use power driven fasteners only for light loads and with specific approval.
- D. In hollow masonry, use steel toggle bolts.
- E. On structural steel, use approved beam clamps or direct weld.
- F. In wood, use wood screws or lag screws or through bolt with nuts and washers.
- G. In sheet metal, use self tapping sheet metal screws or machine bolts with washers and nuts.
- H. In bar joists, use hanger rod between bottom angles secured with washers and nuts.

2.06 HANGERS AND SUPPORTS:

- A. Generally, support piping in accordance with ANSI B31.1 and support ducts in accordance with SMACNA duct construction standards.
- B. Support horizontal steel and copper pipe as follows:
 - 1. For pipe sizes 2" and smaller, use adjustable wrought steel ring or clevis hanger spaced at 5 feet on center with 3/8" steel hanger rod.
 - 2. For pipe sizes 2-1/2" through 4", use adjustable wrought steel clevis spaced at 10 feet on center with 5/8" steel hanger rod.
 - 3. Support high temperature pipe with pipe roller hangers to allow for expansion.
- C. Support cast iron soil pipe 4" and smaller with adjustable wrought steel ring or clevis hanger spaced at 5 feet on center with 5/8" steel hanger rod.

- D. Support PVC pipe with approved hangers at 4 feet on center.
- E. Provide trapeze hangers consisting of steel angles or channels with spacers and steel hanger rods for multiple piping or duct runs.
- F. Provide copper plated hangers if in contact with copper piping.
- G. Provide 18 gauge galvanized saddles for insulated pipe and size hanger to accommodate pipe and insulation.
- H. Use steel riser clamps for vertical piping support through floors. Provide steel bracket and wrought steel clamp for support from walls.
- I. Support ducts with steel bands, steel angles, or steel channels near each transverse joint.
- J. Support piping and ductwork on roof with pipe hangers that do not require roof penetrations, supplemental flashing or damage to roofing material. The system shall consist of high-density polyethylene plastic bases, structural steel frame and pipe hangers and supports as indicated below:
 - a. Gas lines:
 - 1. Up to 2-1/2" model PP10 with roller
 - 2. 3" to 8" model PS-1-2 with roller.
 - b. Water lines (OD with insulation)
 - 1. Up to 2-1/2" model PP10 with strut and hanger
 - c. Gas and water:
 - 1. Above 8" use model PSE-2-2 with clevis hanger.
 - d. Ductwork: All ductwork is to be mounted on model PPH-D supports.

2.07 EQUIPMENT SUPPORTS

- A. All roof mounted equipment where support is not specified elsewhere in this specification shall use model RTU-20 equipment supports.
- B. All roof supports shall be manufactured by Portable Pipe Hangers.

2.08 CONCRETE BASES:

- A. Provide concrete bases for floor mounted equipment indicated on the Drawings and all exterior equipment mounted on grade. Use proper cement-sand mix to achieve strength of 3000 psi after 28 days.
- B. Provide steel reinforcing bars as required and provide proper ties and support during pouring.
- C. Establish sizes of bases required to accommodate equipment. Generally, make bases extend 3" larger than equipment.
- D. Provide properly sized anchor bolts held in position with templates. Where anchor bolts cannot be

held in sufficient alignment, provide adjustable bolts in pipe sleeves.

- E. Prior to pouring, set steel re-bar dowels in holes drilled in existing slab for proper anchorage of base. Install near each corner and at other intervals not to exceed 24 inches.
- F. Trowel finish and rub smooth. Form edges with 3/4" chamfer.
- G. Grout bases for pumps and other vibrating equipment with non-shrink grout.

2.09 SLEEVES:

- A. For pipes or round ducts through dry floors above grade or interior walls, form sleeves with 18 gauge galvanized sheet metal. Sleeves are not required in non fire rated dry wall construction nor slab on grade.
- B. For pipes through outside walls, firewalls, concrete beams, footings or potentially wet floors, provide schedule 40 galvanized steel pipe sleeves. Provide integral waterstop in outside wall sleeves.
- C. For rectangular ducts through walls or floors, form sleeves with steel angles or channels or galvanized sheet metal.
- D. Extend sleeves through floors one inch above floor and seal watertight. For core drilled penetrations in existing floors, provide one inch angle rings set in sealant in lieu of sleeves. Make wall sleeves flush with wall.
- E. Size sleeves to allow for movement due to expansion and to provide for pipe insulation run continuous through sleeves.
- F. Where pipes or ducts pass through sleeves, completely fill space with insulation or approved fire barrier materials. Provide tight fitting escutcheon plates on both sides of wall sleeves as follows:
 - 1. Galvanized sheet metal caps for ducts.
 - 2. Galvanized or cad plated plates for pipes in mechanical spaces or unfinished areas.
 - 3. Chrome plated brass for pipes in finished areas.

2.10 FLASHING AND SEALS:

- A. Where piping penetrates roof membrane, provide 30 inch square sheet of 5 lb/sq. ft. lead or 18 gauge copper. Extend flashing into top of open vent pipes one inch or provide flashing assembly or pitch pan as recommended by roofing manufacturer.
- B. Flash floor drains, except in slab on grade, with copper sheet flashing. Extend flashing under tile or floor finish to 6 inches up wall in showers or 2 feet from floor drain. Clamp flashing to auxiliary drain collar on floor drain.
- C. Provide curbs for all roof mounted equipment. Make curbs minimum of 4 inches above flood level of roof. Flash and counter flash with galvanized sheet metal, soldered and properly waterproofed.
- D. Where piping penetrates outside walls, make watertight with approved sealant or provide modular rubber seal designed for the purpose.

2.11 AIR FILTRATION

- A. General - Air filter shall be equal to Camfil-Farr Aeropleat III, 2" deep pleated media disposable type. Each filter shall consist of a synthetic media blend incorporating an electret charge; a welded wire media support grid, and a high wet-strength beverage board frame. The filter shall be rated by

Underwriters Laboratories as Class 1.

- B. Filter Media – Filter media shall be a blend of cotton and synthetic fibers, multi-layered incorporating mechanical efficiency. The media shall be formed in a radial pleat design to assure full utilization of the media area. When tested in accordance with ASHRAE Standard 52.2-1999, the filter shall have a minimum efficiency reporting value (MERV) of 6.

2-inch - The filter face area shall not be less than 10 pleats per linear foot. Initial resistance at 500 feet per minute shall not exceed 0.23" W.G.

PART 3 - EXECUTION

3.01 MANUFACTURER'S DIRECTIONS:

- A. Handle, install, connect, test, and operate all products, assemblies, and systems in accordance with manufacturer's recommendations.
- B. In case of conflicting requirements between the manufacturer's directions and the Contract Documents, obtain instructions before proceeding with the work.

3.02 INSPECTIONS:

- A. Arrange with the Administrative Authority for inspections of all work required and obtain approval prior to concealing or proceeding with the work.
- B. Give adequate notice before concealing any work for inspections by the Architect or Owner's representatives. Obtain instructions to proceed before concealing the work.

3.03 CLEANING:

- A. Keep the premises clean and free from debris, dirt, etc.
- B. Upon completion of the work, clean and polish all fixtures, equipment, etc.
- C. All ductwork shall be sealed during construction to prevent construction dust from entering ductwork.

3.04 WORKMANSHIP:

- A. Perform all work in accordance with the best practices of the trade and provide a "neat" installation by mechanics skilled in their respective trades and properly licensed.
- B. Accurately install piping, ductwork, and other equipment, plumb, level, and true to line with runs parallel or perpendicular to building lines. Make bends or offsets uniform.
- C. Carefully perform all cutting, drilling, digging, etc., and patch or refinish the disturbed area to the condition of adjoining or similar surfaces in an approved manner. Do not cut any structural member without specific approval. Do not cut any electrical or mechanical lines that may be concealed.
- D. Conceal piping, ductwork, etc. in chases, furrings, or above ceilings unless indicated otherwise. Flush mount equipment required in finished walls where possible.
- E. Coordinate with other trades work and install all work so that all systems and components can be easily maintained and can be removed for replacement in the future.
- F. Provide access to all equipment. Do not locate components that must be serviced, maintained, or replaced above hard ceilings. Where these components absolutely must be above hard ceilings or in

side walls, provide access doors equal to Acudor 5050. Provide fire rated access doors equal to Acudor FW5050 in fire rated ceilings or walls.

3.05 FLAME AND SMOKE CONSIDERATIONS:

- A. In ducts or other enclosures used for transporting environmental air, including return air plenums above ceilings, use only products conforming to NFPA and UL composite classifications not exceeding 25 for flame spread and 50 for smoke developed ratings. This requirement applies to all materials including adhesives, finishes, etc.
- B. Completely seal penetrations through fire and/or smoke rated walls, ceilings, floors, or other barriers for the passage of piping, ductwork, etc. with a UL listed material to preserve the fire/smoke rating of the barrier.
- C. Provide approved fire dampers in air ducts penetrating fire barriers requiring a fire construction rating one hour or greater. Maintain access to fire damper fusible link.

3.06 FAN SHUTDOWN CONTROLS:

- A. Provide smoke detector in supply of units greater than or equal to 2000 CFM. If the entire area served by the unit is not protected by smoke detectors, then provide a smoke detector in the return also of units greater than 2000 CFM. The smoke detectors shall shut the unit down. Provide a smoke detector in the supply of any unit serving a building egress corridor, regardless of unit size.
- B. For system greater than 15000 CFM serving more than one floor, provide smoke detector at each floor in return air duct prior to connect to the common return duct and prior to connection any outside air duct.
- C. If the building contains a fire alarm system, the smoke detectors shall be furnished by fire alarm system supplier. The smoke detectors shall also signal the fire alarm panel. If the building does not contain a fire alarm system, then provide remote indicators in a readily visible location.
- D. Mechanical contractor shall install the smoke/fire detector in the ductwork as appropriate. The controls contractor shall provide a set of dry contact on the outside of each unit to shut the unit down, and the fire alarm contractor shall wire detector to dry contacts and to his own system. Mechanical contractor shall provide smoke detectors if they are not provided by fire alarm contractor.
- E. In exhaust only systems, the smoke detectors shall not be required.

3.07 COORDINATION:

- A. Coordinate the mechanical work with the work of related trades to avoid interference's. Determine the exact route of piping and ductwork prior to fabrication and the exact location of each outlet and equipment connection prior to installation.
- B. Study the Architectural, Structural, Mechanical and Electrical Drawings, and Specifications including Shop Drawings and manufacturer's technical data sheets, and compare to actual site conditions and constraints. In case of conflicts or interference, obtain clarification or instructions before performing any work.
- C. Piping or equipment requiring slope or specific mounting elevations will generally have right of way over products whose elevations can be changed.
- D. Carefully plan the sequence of work as required to minimize disruptions and installation time.

3.08 EQUIPMENT CONNECTIONS:

- A. Make all required utility connections to each item of equipment shown or specified including equipment furnished by Owner, and make operational.
- B. Connect overflows, relief discharges, blowdowns, drain valves, etc. with approved piping and extend to floor drains or other approved discharge points.
- C. Make all electrical connections to equipment including power supply and control wiring in accordance with Division 16, Electrical.

3.09 PROTECTION REQUIREMENTS:

- A. Locate existing utility lines and adequately identify and protect during the execution of the work.
- B. Protect public and private property against damage.
- C. Protect all work including building finishes against damage due to dirt, water, chemicals, frost, heat, handling, theft, etc. Keep openings in piping and ductwork and equipment closed with suitable plugs or caps during installation.
- D. Provide necessary warning devices, barricades, or coverings required for safety around moving parts, sharp objects or high temperature surfaces.

3.10 CHASES AND OPENINGS:

- A. Provide templates or details for chases and other openings required through floors, walls, ceilings, etc. to accommodate piping or ductwork.

3.11 TRENCHING AND BACKFILLING:

- A. Excavate bottoms of trenches to required depth and grade for proper slope with uniform and solid bearing for piping. Do not lay pipe on mud, rocks, or unstable soil. Remove unsuitable bearing material and backfill to proper depth with sand or other approved material. If limestone products are used, protect all copper piping from contact with the limestone using sealed insulation or approved sleeving material.
- B. After piping has been satisfactorily leak tested and approved, backfill trench to a depth of one foot above top of pipe with sand or fine pea gravel. Install continuous strip of plastic "CAUTION" tape over pipe and sand. Use suitable material for remaining backfill to finished grade, tamped to 95% compaction.
- C. Before beginning any trenching, locate and determine elevation of all affected piping. Verify that drain lines to be connected to are deep enough to allow sufficient slope before starting trenching.

3.12 PIPING INSTALLATION:

- A. Erect piping without forcing or springing and allow for proper clearance and headroom.
- B. Provide for expansion and contraction with piped loops, changes in direction, or approved expansion couplings.
- C. Install all piping in a manner to prevent freezing. If necessary to install water piping in unheated spaces or outdoors above the frost line, provide electric heat tracing around pipe prior to insulating.

3.13 PAINTING:

- A. Paint ductwork, piping, equipment, etc. exposed in finished areas to match adjacent surfaces as directed. Paint items flat black or as directed if visible through grilles or other openings.
- B. Paint all exposed piping and equipment in mechanical spaces for uniform appearance or identification as directed.
- C. Paint ferrous piping, equipment, hangers, etc. exposed outdoors or subject to rusting, with one coat primer and two coats of approved exterior enamel based paint.
- D. Not used.
- E. Paint plywood backboards used for mounting equipment.

3.14 LABELING

- A. For any fresh air vents located on the roofs, the vents shall be properly marked with the word "intake" permanently attached to the vent.

3.15 TESTING, ADJUSTING, AND BALANCING (Only RTUs and other units with ceiling mounted diffusers):

- A. After systems are completed and fully operational, perform Testing, Adjusting, and Balancing (TAB) in accordance with procedures recommended in ASHRAE Systems volume, AABC Standards, and NEBB Standards on the following systems:
 - 1. Supply Air System
 - 2. Return Air System
 - 3. Exhaust Air System
 - 4. Outside Air System
- B. Furnish all test equipment, tools and instrumentation required for TAB. Submit proof of calibration when required.
- C. Before beginning TAB, submit forms to be used to the Engineer for approval or use the attached forms.
- D. Adjust fan speeds, dampers, valves, and other controls to achieve design ratings. Balance each air device or valve to within plus or minus 10 percent of indicated flow rates. Perform TAB for each possible mode of operation.
- E. Notify Engineer 24 hours prior to taking final readings and arrange for Engineer to be present for final readings.
- F. Obtain and record all measurements required for final TAB report. Include at least the following data:
 - 1. Running amperes and voltage at each motor 3/4 horsepower or larger. Indicate rpm and direction of rotation.
 - 2. Air flow rates (cfm) at each supply air outlet, return and outside air intake.
 - 3. Dry bulb air temperatures in each conditioned space and at entrance and exit of all coils with corresponding outside air temperature. Record refrigerant pressures at the same time.
 - 4. Static pressures in each control zone relative to outdoors and across each fan, air filter, major component, and major duct run.

- G. TAB shall be performed by a qualified TAB specialist approved by the Engineer.

3.16 POST CONSTRUCTION SUBMITTALS:

- A. Deliver special tools, lubricants, and other products necessary for proper operation and maintenance of the mechanical systems.
- B. Deliver spare parts as called for under other Mechanical Sections contained herein or on the Drawings.
- C. Submit Project Record Documents indicating all changes from the Contract Documents made during construction.
- D. Submit Certificates of Final Inspections from the Administrative Authority.
- E. Per the State Energy Code, prior to issuance of a certificate of occupancy submit Operation and Maintenance Manuals covering all phases of equipment and systems provided. Include complete spare parts data with current prices and sources of supply. Include copy of manufacturing data sheets, shop drawings required in pre-construction submittals, HVAC system control maintenance and calibration information, wiring schematics, controls sequence descriptions and set points, and a complete written narrative of how each system is intended to operate.
- F. Submit extended warranties in excess of the standard one year warranty where required by other Mechanical Sections contained herein or on the Drawings.
- G. Submit TAB report on approved record forms.

3.17 INSTRUCTIONS TO OWNER:

- A. Provide competent instruction to Owner's personnel covering operation and maintenance of all mechanical systems. Provide specialized instruction by manufacturer's technical representatives when required.
- B. Provide close out documents to owner per Section 15785.

END OF SECTION

MECHANICAL INSULATION
SECTION 23 07 00

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Interior air duct acoustical/thermal liner
- B. Exterior duct wrap insulation
- C. Refrigerant piping insulation
- D. Cooling condensate drain insulation

1.02 RELATED WORK:

- A. Section 23 01 00 General Mechanical Requirements
- B. Section 23 30 00 Low Pressure Ductwork and Accessories

1.03 SUBMITTALS:

- A. Submit Manufacturer's Data Sheets on each type of insulation to be used.

1.04 QUALITY ASSURANCE:

- A. Perform installation in accordance with MICA, Commercial and Industrial Insulation Standards.
- B. Follow manufacturer's directions on adhesive application, fastener spacing, etc.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Glass fiber type equal to Owens-Corning Fiberglass 23ASJ\SSL for 1/2" and greater thickness.
 - 1. K-factor no greater than 0.24
 - 2. Jacket permeance no greater than 0.02 perms.
 - 3. Self sealing laps on longitudinal and transverse joints of all service jacket.
 - 4. J-M "Zeston" PVC fitting covers over Fiberglass inserts for valves and fittings. Provide 25/50 flame/smoke rating when used in air plenums.
- B. Flexible elastomeric pipe insulation equal to Armstrong "Armaflex" for 1/2" and less thickness.
 - 1. Use proper adhesive.
 - 2. Use sheets cut and molded around valves and fittings.
 - 3. Do not use in air plenums unless 25/50 flame/smoke rated.
- C. Acoustical Fiberglass interior duct liner with 1-1/2 lb. density and coated face. Meet UL 181 on erosion tests and NFPA 90A on flame/smoke rating.

- D. Flexible Fiberglass exterior duct wrap equal to FRK-25.
 - 1. K-factor no greater than 0.3.
 - 2. 3/4 lb. density.
 - 3. Foil reinforced kraft (FRK) vapor barrier.

- E. Foam/vinyl safety covers for drains & supply lines equal to Plumberex "Handy-Shield."
 - 1. White vinyl cover over insulating foam liner.
 - 2. Locking strap with recloseable sealing strips and weep seam.
 - 3. Meet Federal Std. 4.19.4 GSA and ANSI A117-1-1980.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Successfully perform all leak tests prior to applying insulation.

- B. Provide approved coating of mastic over piping insulation jackets installed underground and make waterproof and puncture resistant.

- C. Insure surfaces are clean and dry prior to installing insulation.

- D. Neatly finish insulation at hangers or other protrusion. Seal vapor barrier joints in duct wrap with FRK duct tape.

- E. Ducts 18" upstream and 30" downstream from electric resistance and fuel burning heaters located within duct system will be wrapped externally with fiberglass duct wrap. (See Specification Section 15250, Mechanical Insulation Part 2-2.01-D)

- F. All supply and return air systems installed in any unconditioned space shall be insulated with a minimum of 2" thickness, 3/4 density wrap, or 1" thickness, 1-1/2 lb density liner.

3.02 INSULATION SCHEDULE:

See drawings for insulation schedule.

END OF SECTION

NATURAL GAS PIPING SYSTEM
SECTION 23 11 13

PART I - GENERAL

1.01 WORK INCLUDED:

- A. Underground natural gas service piping
- B. Interior natural gas piping
- C. Exterior exposed natural gas piping
- D. Connectors for appliances and other equipment
- E. Cocks

1.02 RELATED WORK:

- A. Section 23 01 00 General Mechanical Requirements

1.03 SUBMITTALS:

- A. Submit manufacturer's Data Sheets on gas cocks.
- B. Submit list of piping products to be used and state their manufacturers, classes or types, and other applicable data.
- C. Submit record drawings indicating actual location and routing of piping as installed.

1.04 QUALITY ASSURANCE:

- A. Conform to ASME Code and applicable state regulations with all welding materials and welding operator's qualifications. Use only operators fully qualified and certified under the requirements of the Arkansas Gas Pipeline Code (AGPC).

PART 2 - PRODUCTS

2.01 PIPING:

- A. Underground piping:
 - 1. Schedule 40 black steel or galvanized steel with malleable iron fittings or welded joints with butt weld fittings.
 - 2. Mill coat pipe with high density polyethylene over adhesive undercoating.
 - 3. Wrap field joints and fittings with Republic "X-Tru-Tape" or equal per manufacturer's recommendations.
- B. Above ground piping:
 - 1. Schedule 40 black steel or galvanized steel with malleable iron fittings or welded joints with butt weld fittings.

- C. Connectors for appliances and other equipment:
 - 1. PVC coated spiral flexible brass connector with brass flared gas tubing fittings.
- D. Cathodic Protection - Packaged magnesium anodes.
- E. Welding Rod - Same material as pipe.

2.02 GAS COCKS:

- A. Iron body with brass plug and washer with screwed or flanged ends rated for 125 lb. WOG.

PART 3 - EXECUTION:

3.01 PREPARATION:

- A. Ream pipes and tubing prior to connecting.
- B. Remove welding slag from welded connections.

3.02 INSTALLATION:

- A. Slope natural gas piping minimum of 1 inch in 40 feet and provide minimum 12" deep drip pocket same size as pipe, at all low points and at final connections to equipment. Provide malleable iron removable screw-on cap on bottom of drip pocket.
- B. Bury underground gas piping minimum of 2 feet below finished grade.
- C. Provide one or more anodes, sized for pipe size and length of underground service.
- D. Use flexible connector and gas cock for final connection to each appliance or other gas fueled unit.
- E. Provide dielectric union where piping emerges from underground.
- F. Weld all connections where piping must be concealed. Provide ventilated pipe sleeves where required.
- G. Use teflon tape or other approved joint compound to connect threaded pipe.
- H. Arrange with local utility for gas tap and meter installation. Pay all costs to establish natural gas service.
- I. Make sure all piping concealed in walls or other areas are properly vented. At top of solid walls vent with opening which is 2 times the diameter of the pipe.
- J. Provide ventilated pipe sleeves under all paving and other hard surfaces.
- K. Bond interior metal gas piping to the electrical system ground. Piping shall be electrically continuous.
- L. Install continuous strip of plastic utility marker tape over gas piping. Use strip with trace wire for plastic pipe.
- M. Identify and label medium pressure gas piping at both ends and the 6 foot intervals in between.

3.03 TESTING:

- A. Before concealing, test natural gas piping system and prove leak free. Subject system to at least 50

psig air pressure for 30 minutes.

- B. Check underground piping coating with a "Holiday" detector and prove free from leakage currents through coating.

END OF SECTION

HVAC AIR DISTRIBUTION
SECTION 23 30 00

PART 1 – GENERAL

1.01 WORK INCLUDED:

- A. Low and medium pressure sheet metal ductwork including plenums
- B. Grease ductwork
- C. Wet ductwork
- D. Ductwork below slab
- E. Flexible insulated ducts
- F. Air devices including louvers and dampers
- G. Other duct accessories

1.02 RELATED WORK:

- A. Section 23 01 00 (15010) Operation and Maintenance of HVAC Systems
- B. Section 23 07 00 (15250) HVAC Insulation

1.03 SUBMITTALS:

- A. Submit Manufacturer's Data Sheets on air devices, dampers, louvers, flexible duct, take-off fittings and other manufactured items.
- B. Submit Shop Drawings of ductwork layouts, fittings and air devices prior to installation of ductwork.

1.04 QUALITY ASSURANCE:

- A. Fabricate ductwork in compliance with SMACNA Duct Construction Standards and NFPA 90A.
- B. Provide kitchen grease ducts in compliance with NFPA 96.

PART 2 - PRODUCTS

2.01 SHEET METAL DUCTS:

- A. Use galvanized steel lock forming quality with 1.25 ounces per square foot zinc coating on each side.
- B. Use rivets or sheet metal screws for fasteners.
- C. Use proper water and fire resistant sealant.

2.02 GREASE DUCTS:

SECTION 23 30 00
HVAC AIR DISTRIBUTION

- A. For kitchen hood exhaust duct, use No. 16 MSG carbon steel if concealed. Use No. 18 MSG stainless steel if exposed in kitchen.
- B. Provide proper clearances to building construction or insulate duct with approved material.
- C. Weld seams and make air tight.

2.03 WET DUCTS:

- A. For dishwasher exhaust, use No. 22 MSG stainless steel. Weld seams and make watertight.
- B. All supply, return and exhaust ductwork in shower areas shall be 3003-H14 aluminum. Fasten with rivets or sheet metal screws.

2.04 DUCTWORK BELOW SLAB:

- A. All ductwork below slab shall be 50 PSI rated PVC piping as manufactured by Peerless Manufacturing Company or equal.
- B. All fittings shall be PVC and shall be sealed tight with silicone caulking and sheet metal screws.

2.05 FLEXIBLE DUCTS:

- A. Flexible spiral wound duct with 1" insulation and vapor barrier equal to Owens-Corning Fiberglas INL-25 or ATCO Series 900.
 - 1. Insulation conductance at 75°F, no greater than 0.23 btu/hr. sf. deg.
 - 2. Vapor transmission of vapor barrier no greater than 0.1 perms.

2.06 AIR DEVICES:

- A. Furnish and install items as scheduled on the Drawings.
- B. Provide ceiling mounted devices compatible with ceiling type.
- C. Provide storm proof type louvers with heavy gauge wire mesh on outside. Field paint as directed.
- D. Provide insulated low energy motorized shutter-dampers for large outdoor air intakes as scheduled.

2.07 DUCTWORK ACCESSORIES:

- A. Provide double thickness airfoil type turning vanes at all rectangular elbows. Perforated, internally insulated blades shall be used on ducts 20" and wider.
- B. Provide 16 gauge galvanized steel balancing dampers with quadrants or adjustment rod and lock screw where required for proper TAB.
- C. Fabricate splitter dampers of double thickness sheet metal with streamlined shape. Provide exterior adjustment rod and lock screw.
- D. Where round duct takes off from rectangular duct, provide high efficiency take off and butterfly volume damper. Take off fitting shall be manufactured with 1" flange, 3/4" x 14" neoprene gasket, and eccentric adaptor with 45° transition on upstream side.

- E. Provide flexible connections of neoprene coated flameproof fabric tightly crimped into metal edging strips. Attach to ductwork and equipment with sheet metal screws.
- F. Provide access doors at duct and at ceiling where required for maintenance and inspection. Fabricate of galvanized steel with gaskets and quick fastening locking devices. Provide double thickness insulated door in insulated ductwork.
- G. When indicated on Drawings, provide type B fire damper of the curtain type with fusible link with 90% free area of duct. Select fusible link for 160°F unless shown otherwise. Provide access doors at all fire dampers.

2.08 MEDIUM PRESSURE PRIMARY AIR SYSTEMS:

- A. Provide all ductwork materials and gauges in compliance with applicable SMACNA Standards for high velocity ductwork. (Not snap lock)
- B. All primary air ductwork shall be round, except at fan discharge.
- C. All fittings shall be low pressure loss type.
- D. Use 45° conical wye fittings at all branch outlets.
- E. Make all size transitions concentric and smooth.
- F. All 90° elbows shall be smooth, one piece type with a centerline radius equal to 1.5 times the duct diameter.
- G. The primary air system shall perform equal to that shown on the plans, providing the minimum static pressure and air volume is scheduled at all outlets (mixing boxes), with the air handling unit fan external static pressure equal to that shown.
- H. All concealed round ductwork shall be wrapped with insulation. All exposed ducts shall be double wall spiral with 1" acoustic insulation liner and acoustic perforated inner metal duct.
- I. Seal all joints air tight with tape.

PART 3 - EXECUTION

3.01 FABRICATION:

- A. Provide proper duct reinforcing with angles or cross breaks per SMACNA Standard, insulate per Section 23 07 00 (15250).
- B. Lap metal ducts in direction of air flow.
- C. Make transitions gradually with divergence no greater than 30°.
- D. Rigidly construct ducts with tight joints free from vibration, rattles, or air noise. Audible leaks shall be sealed with approved sealant.
- E. Construct plenums of galvanized panels suitably reinforced and diagonally braced.

3.02 INSTALLATION:

- A. Use flexible duct (5 feet or less) for final connection to supply air devices only in lay-in ceilings. Connect with strap or clamp. Do not use on return ducts.
- B. Use flexible fabric connections at each fan and air handling device.
- C. Verify locations required of outlets and make adjustments to coordinate with architectural features, lighting fixtures, etc.
- D. Adjust air devices for proper throw distance and direction prior to air balancing.
- E. Provide at least either two lined, rectangular elbows or 15 feet of lined, rectangular, straight duct between the supply and return connection of all forced air units and the first diffuser runout connection to the trunk duct.
- F. Seal all longitudinal and transverse joints with mastic type duct tape per the current State Mechanical Code and the current State Energy Code.
- G. Provide leak testing of all duct systems as required by the current State Mechanical Code and the current State Energy Code.

END OF SECTION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Centrifugal cabinet fans
- B. Fan accessories

1.02 RELATED WORK:

- A. Section 23 01 00 Operation and Maintenance of HVAC Systems
- B. Section 23 31 00 HVAC Ducts and Casings

1.03 SUBMITTALS:

- A. Submit Manufacturer's Data Sheets on all fans and accessories. Indicate operating point(s) on fan curve and noise data.

PART 2 - PRODUCTS

2.01 SCHEDULED ITEMS:

- A. Provide fans and accessories as scheduled on the Drawings or equal. Equivalent fan substitutions shall not increase horsepower or noise level for specified air volume.
- B. Provide fans capable of accommodating static pressure variations of plus or minus 10%.
- C. Provide adjustable sheaves and belt guards on belt driven fans.
- D. Provide guards or safety screens on exposed blades or wheels.
- E. Statically and dynamically balance fans for minimum vibration. Resiliently mount centrifugal wheels.
- F. Provide rattle free backdraft dampers with lined edges except for kitchen hood exhausters.
- G. Provide roof curb, birdscreen, and cord and plug disconnect for roof mounted fans except kitchen hood exhausters.
- H. Provide solid state speed controller for direct driven fans where indicated or required to achieve specified performance.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Follow manufacturer's directions. Verify correct rotation of fan wheels.
- B. Provide shutdown controls per Section 23 01 00.

3.02 BALANCING:

- A. Balance each fan to specified flow rate for the actual static pressure. Adjust or replace sheaves on belt drives or adjust speed controls. Provide balancing dampers when required.

END OF SECTION

PART I - GENERAL

1.01 WORK INCLUDED:

- A. Forced air furnaces
- B. Unit controls and safety devices
- C. Accessories

1.02 RELATED WORK:

- A. Section 23 01 00 General Mechanical Requirements
- B. Section 23 30 00 Low Pressure Ductwork and Accessories

1.03 SUBMITTALS:

- A. Submit Manufacturer's Data Sheets on each furnace including all accessories. Clearly indicate optional features to be furnished. Include detailed instructions and dimensions.
- B. Submit extended warranties required herein.

1.04 QUALITY ASSURANCE:

- A. Furnish units complying with ANSI Standards for safety and efficiency and certified by AGA for outdoor applications.

1.05 EXTENDED WARRANTIES:

- A. Provide ten year unconditional parts warranty on heat exchangers.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Acceptable manufacturers other than those scheduled are York, Carrier, Lennox and Trane Company.

2.02 FURNACES:

- A. Provide fully assembled gas furnace with capacities as scheduled.
- B. Furnish with 20 gauge galvanized steel casing with factory painted enamel finish. Insulate plenums and fan section with one inch fiberglass or fire-rated insulating material. Furnish outside air and exhaust openings with heavy wire mesh insect screens.
- C. Fans to be belt driven or direct drive, forward curved, centrifugal type. Dynamically balance fans and resiliently mount.

- D. Heating section non-condensing furnaces shall include:
1. Seam welded aluminized steel with 20 gauge tubes and 18 gauge headers.
 2. 20 gauge aluminized steel burners.
 3. Hot service ignition and all other required safety controls in the valve train. Furnish fan delay control for both ON and OFF.
 4. Redundant main gas control.
 5. Low energy power induced draft vent blower.
- E. Heating Section – Condensing type furnaces shall include:
1. Energy saving type 29-4C stainless steel finned recuperative coil.
 2. Durable, cycle tested, heavy gauge aluminized steel heat exchangers.
 3. Linear aluminized steel burners.
 4. Reinforced Noryl condensate collector and flue passage.
 - Complete front service access.
 - Baked enamel finish.
 - Multi-speed direct drive blower assembly for automatic heat/cool air volume variation.
 - Air conditioning fan relay.
 - 35 VA transformer to serve heating and air conditioning control system.
 5. Unique single-speed induced draft blower assembly to handle 40 MPH wind force in sidewall discharge application.
 6. Dual gas valve and regulator.
 - Limit and adjustable fan control.
 - Blower door safety switch.
 7. Energy-saving hot surface igniter system with safety control.
 8. Vent proving pressure differential switch.
 9. Inlet air pressure differential switch.
 10. Flame roll out safety device.
 11. Flue temperature safety thermostat.
 12. Direct vent with piped combustion air and flue gas.
 13. Provide manufacturer's wall or roof combination combustion air/ flue gas outlets.
 14. The vent collar shall have a built-in secondary drain to remove condensation.
- F. Provide filter frame and filter as scheduled. If not scheduled, provide 2" thick, 30% efficient pleated media filter system mounted in the return airstream of the furnace.
- G. Fan shutdown controls per Section 23 01 00

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Provide watertight installation and connect ducts, natural gas piping, electrical power and control wiring for proper operation.
- B. Provide thermostat as scheduled on drawings.

END OF SECTION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Outdoor Condensing Units with compressors
- B. Cooling (evaporator) coils
- C. Unit controls and safety devices
- D. Refrigerant Piping and Insulation
- E. Accessories

1.02 RELATED WORK:

- A. Section 23 01 00 General Mechanical Requirements
- B. Section 23 61 00 Forced Air Furnaces

1.03 SUBMITTALS:

- A. Submit Manufacturer's Data Sheets on each unit and all accessories to be furnished. Clearly indicate optional features to be furnished and all electrical requirements. Include detailed installation instructions and dimensions.
- B. Submit Shop Drawings on special mounting arrangements if not included in standard installation instructions.
- C. Submit extended warranties required herein.

1.04 OPERATING EFFICIENCY:

- A. Provide condensing unit and evaporator coil combination to achieve an SEER/EER rating as scheduled.

1.05 QUALITY ASSURANCE:

- A. Capacities shall be rated and listed in accordance with ARI Standard 210.
- B. Furnish condensing units certified by AGA for outdoor applications and UL listed for the application.

1.06 EXTENDED WARRANTY:

- A. Provide five year unconditional parts warranty on compressors.
- B. Provide one year entire parts, labor, and refrigerant warranty on unit.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Acceptable manufacturers are Carrier, York, Trane.

2.02 CONDENSER CASING:

- A. Provide units factory assembled, piped, wired, and charged with refrigerant. Include all motor starters, overloads, and contactors, and provide 24 volt control transformer.
- B. Furnish with 20 gauge zinc-coated steel casing with baked enamel finish.
- C. Provide hermetically sealed compressor(s) with the following refrigeration safety controls:
 - 1. Compressor overloads including over-current and over-temperature.
 - 2. High pressure controls.
 - 3. Low pressure controls on units over 5 tons.
 - 4. Crankcase heaters if scheduled.
 - 5. Provide anti-short cycling control.
 - 6. 4 Minute time delay between starting compressors on multi-compressor models.
- D. Use copper tubing mechanically bonded to aluminum fins for evaporator and condenser coils. Perform successful pressure and leak tests at the factory on each coil.
- E. Condenser fans to be direct drive balanced propeller fans with weatherproof motors.
- F. Provide fully insulated suction line refrigerant piping using at least 1" elastomeric foam insulation (Armaflex). For condensing units mounted on the ground, protect exposed insulation using Techflex F6 split-wrap expandable braided sleeve.
- G. Provide condenser coil hail protection (not a coil guard).

2.03 EVAPORATOR CASING:

- A. Provide fully gasketed and insulated (1" of 1 lb. density) evaporator coil casing. Provide insulated drain pan with appropriate P trap.
- B. Provide expansion device at evaporator coil. For capacities of 5 tons and under, use expansion orifice; for capacities over 5 tons, use only thermal expansion valves.
- C. Provide Type L copper refrigerant piping sized per manufacturers recommendation.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Provide installation and connect refrigerant piping, electric power, and control wiring for proper operation.
- B. Limit all refrigerant piping to 50' in length where possible. For piping over 50' in length, obtain written approval of refrigerant piping design from manufacturer prior to installation.

END OF SECTION

PART I - GENERAL

1.01 WORK INCLUDED:

- A. Ductless split systems – Air conditioners and heat pumps.
- B. Accessories

1.02 RELATED WORK:

- A. Section 23 01 00 General Mechanical Requirements

1.03 SUBMITTALS:

- A. Submit Manufacturer's Data Sheets on each unit and all accessories to be furnished. Clearly indicate optional features to be furnished and all electrical requirements. Include detailed installation instructions and dimensions.
- B. Submit extended warranties required herein.

1.04 QUALITY ASSURANCE:

- A. Furnish units UL listed for the application.
- B. Provide one year unconditional warranty on complete unit.

1.05 EXTENDED WARRANTY:

- A. Provide five year unconditional parts warranty on compressor unit.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Acceptable manufacturers are Sanyo and Mitsubishi, Fujitsu, Daikin, Liebert.

2.02 AIR CONDITIONERS:

- A. Wall mounted and ceiling suspended systems shall include microprocessor controls, three speed plus automatic fan, on/off 24 hour timer, low ambient control, washable air filter, wireless remote control and power failure automatic restart. Indoor unit shall operate at sound levels at or below or below 50 dB-A. Outdoor unit shall operate at sound levels to or below 65 dB-A.
- B. Ceiling recessed systems shall include microprocessor controls, three speed plus automatic fan, on/off 24 hour timer, low ambient control, built in condensate pump, washable air filter, wireless remote control and power failure automatic restart. Indoor unit shall operate at sound levels at or below or below 45 dB-A. Outdoor unit shall operate at sound levels to or below 65 dB-A.

2.03 HEAT PUMPS:

SECTION 23 81 31
DUCTLESS SPLIT SYSTEMS

- A. Wall mounted system shall include microprocessor controls, wireless remote control, 24 hour on/off program timer, automatic defrost cycle, heating cooling automatic changeover, hot start system, three speed plus automatic fan and non-polar wiring. Indoor unit shall operate at sound levels at or below 50 dB-A. Outdoor unit shall operate at sound levels to or below 60 dB-A.
- B. Ceiling suspended system shall include microprocessor controls, wireless remote control, 24 hour on/off program timer, electric resistant back-up heater, automatic defrost cycle, heating cooling automatic changeover, hot start system, three speed plus automatic fan and non-polar wiring. Indoor unit shall operate at sound levels at or below 45 dB-A. Outdoor unit shall operate at sound levels to or below 65 dB-A
- C. Floor mounted systems shall include microprocessor controls, unit mounted control panel, 12 hour on/off program timer, electric resistant back-up heater, automatic defrost cycle, heating cooling automatic changeover, hot start system, three speed plus automatic fan, fresh air intake knockout and non-polar wiring. Indoor unit shall operate at sound levels at or below 50 dB-A. Outdoor unit shall operate at sound levels to or below 55 dB-A

2.04 ELECTRICAL

- A. Single point electrical connection at outdoor condensing unit, indoor unit wired to outdoor unit.

2.05 ACCESSORIES:

- A. Provide outdoor unit mounting bracket, refrigerant line set and locking bracket for remote control.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Provide complete installation and connect electric power, and control wiring, refrigerant piping and insulation for proper operation. Provide condensate piping and condensate pump as required.
- B. Mount remote wireless control unit using manufacturers wall bracket, at location shown on plans.

END OF SECTION

GENERAL ELECTRICAL REQUIREMENTS
SECTION 26 01 00

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Comply with the Conditions of the Contract, General and Supplementary Conditions, and any other applicable requirements contained herein or issued under separate cover.
- B. Perform other work related to or necessary for the electrical installation in accordance with the applicable Specification Division or Section contained herein.
- C. In Electrical Specification Sections, items under "RELATED WORK" are listed for convenience only and are not guaranteed to be a complete listing of all applicable work.

1.02 CODES, REGULATIONS, AND STANDARDS:

- A. Comply with the latest edition of applicable codes including the following:
 - 1. International Building Code
 - 2. Life Safety Code (NFPA 101)
 - 3. National Electrical Code NEC (NFPA 70)
 - 4. State Fire Prevention Code
- B. Comply with applicable Regulations as amended, including the following:
 - 1. State Department of Health Regulations
 - 2. Rules and Regulations for Energy Efficiency Standards for New Building Construction
 - 3. State and Federal Department of Labor Regulations
 - 4. Occupational Safety and Health Act (OSHA)
 - 5. Utility Company Regulations and Requirements
 - 6. Other State and Federal Laws and Regulations
 - 7. Local Ordinances
 - 8. State Department of Education Minimum Schoolhouse Construction Standards
- C. Furnish products and perform installation conforming to the latest accepted Standards published by the following organizations:
 - 1. Underwriter's Laboratories, Inc. (UL)
 - 2. National Fire Protection Association (NFPA)
 - 3. National Electrical Manufacturer's Association (NEMA)
 - 4. American Society of Testing Materials (ASTM)
 - 5. American National Standards Institute (ANSI)
 - 6. Institute of Electrical and Electronic Engineers (IEEE)
 - 7. Insulated Power Cable Engineer's Association (IPCEA)
 - 8. Certified Ballast Manufacturer (CBM)
 - 9. Electrical Testing Laboratories (ETL)
 - 10. Illuminating Engineering Society (IES)
 - 11. Insurance Service Office (ISO)
 - 12. Factory Insurance Association (FIA)
 - 13. Factory Mutual (FM)
 - 14. National Sanitation Foundation (NSF)
 - 15. Electronic Industry Association/Telecommunications Industry Association (EIA/TIA)

- D. In case of discrepancy or conflict between Codes, Regulations, Standards, Drawings and/or Specifications, the requirement yielding the higher(est) quality of work shall govern.

1.03 PERMITS AND ADMINISTRATIVE FEES:

- A. Obtain and maintain all necessary licenses, permits and inspection certificates and pay all fees including connection fees, taxes and penalties, if any, required by the Administrative Authority. Refundable deposits will be paid by the Owner.

1.04 PRE-CONSTRUCTION SUBMITTALS:

- A. Refer to each Electrical Section for a listing of required Submittals under that Section. Refer to Section entitled Shop Drawings, Product Data, and Samples for submittal procedure and requirements.
- B. Submit for approval, Manufacturer's technical data sheets including performance specifications for all equipment, major materials, and other manufactured items. Obtain approval on product manufacturers not specifically named prior to making submittals.
- C. Submit for approval, Contractor's original Shop Drawings of all assemblies of manufactured items including complete wiring diagrams. Indicate all pertinent dimensions on scale drawings necessary for clarity and for coordination of the installation between trades.
- D. Submit for approval, a schedule of nameplates and test report forms.
- E. Bind Submittals in durable cover(s) with contents conveniently organized and properly indexed.
- F. Make Submittals on all work contained in Division 16, Electrical, at one time except by special permission.

1.06 INTENT:

- A. It is intended that the Contractor provide a complete and operating electrical system including all incidental items and connections necessary for proper operation or customarily included even though each and every item may not be indicated.
- B. The Drawings indicate the general layout requirements for equipment, fixtures, conduit, devices, etc. Final layout will be governed by actual field conditions with all measurements verified at the site.
- C. Conduit and wiring shown on the Drawings are diagrammatic unless noted otherwise, and are intended to indicate switching and branch circuit arrangements, phase balance, and general wiring connection requirements.
- D. It is intended that the electrical installation be safe, reliable, energy efficient, and easily maintained with adequate provisions for access to equipment.
- E. It is intended that the electrical system operate quietly with noise levels below the criteria recommended for the application by NEMA. Provide corrective action as required to reduce objectionable hum or vibration. Acoustically insulate between outlet boxes in common wall serving different rooms.
- F. The Drawings indicate diagrammatically the number and function of the conductors required for the conduit routing as shown. The Contractor has the option of changing the routing or combining circuits in one conduit run, providing the installation does not interfere with work of other trades, the system functions as intended, the ampacity of the conductors is derated in accordance with the NEC, and none of the loads require a dedicated circuit or isolated ground. Indicate actual conduit routing

and conductor arrangement on record drawings. Neutrals for circuits serving non-linear loads are considered a current carrying conductor.

- G. Lighting and general purpose 20-ampere branch circuits may share a common neutral, provided each branch circuit is derived from a different phase leg. Isolated ground circuits as well as circuits serving non-linear loads and those served with ground fault circuit breakers must have their own neutral or isolated ground. Branch circuits serving computers shall have a separate neutral for each circuit. Panelboards serving mostly computer loads shall have a double neutral feeder.
- H. "Home runs" are indicated on the Drawings with arrows from the branch circuit outlets pointing in the general direction of the panelboards to which they connect, complete with the panelboard and circuit designations. Continue "home runs" to the designated panelboards as though the conduit runs were shown in their entirety.

PART 2 - PRODUCTS

2.01 PRODUCT REQUIREMENTS:

- A. Furnish only new standard products of a manufacturer regularly engaged in the production of said products.
- B. Support all products by service organizations with adequate spare parts inventory and personnel located reasonably close to the site.
- C. Where multiple units of the same type or class of products are required, provide all units of the same manufacturer.

2.02 PRODUCT HANDLING:

- A. Store products in the original containers and shelter in a suitable environment at an approved location.
- B. Make products readily accessible for inspections and inventory accounting.

2.03 PRODUCT SUBSTITUTIONS:

- A. For products specified by generic reference standard, select any product meeting such standard.
- B. For products specified by naming one or more products or manufacturers, select any named. Submit request for substitution of any manufacturer not specifically named and obtain approval prior to bidding.
- C. Provide all information required to support claim of "equality" of product proposed for substitution. Substitutions will be considered only if equivalent in quality, efficiency, performance, size, weight, reliability, appearance, and ease of maintenance to the specified product or manufacturer.
- D. Where approved product substitutions alter the design, space requirements, electrical requirements, connections, cooling loads, or etc., include all work necessary to provide a complete installation of quality equal to or better than that which would have been achieved with products of manufacturers as specified.

2.04 PRODUCT APPLICATION:

- A. Furnish products that are UL listed for their intended use and environment. For example, use only rain tight products suitable for wet locations when installed outdoors or where indicated on the Drawings to be weatherproof (WP).

PART 3 - EXECUTION

3.01 MANUFACTURER'S DIRECTIONS:

- A. Handle, install, connect, test, and operate all products, assemblies, and systems in accordance with manufacturer's recommendations.
- B. In case of conflicting requirements between the manufacturer's directions and the contract documents, obtain instructions before proceeding with the work.

3.02 INSPECTIONS:

- A. Arrange with the Administrative Authority for inspections of all work required and obtain approval prior to concealing or proceeding with the work.
- B. Give adequate notice before concealing any work for inspections by the Owner's representatives. Obtain instructions to proceed before concealing the work.

3.03 CLEANING:

- A. Keep the premises clean and free from debris, dirt, and etc.
- B. Upon completion of the work, clean and polish all fixtures, equipment, and etc.

3.04 WORKMANSHIP:

- A. No person shall perform electrical work on the contract without possessing a Master or Journeyman License from the State Electrical Examiners Board. All electrical work and apprentice electricians shall be supervised by a Master or Journeyman Electrician on a one to one ratio.
- B. Perform all work in accordance with the best practices of the trade and provide a "neat" installation by technicians skilled in their respective trades and properly licensed.
- C. Accurately install conduit, and other equipment plumb, level, and true to line with runs parallel or perpendicular to building lines. Make bends or offsets uniform.
- D. Carefully perform all cutting, drilling, digging, and etc., and patch or refinish the disturbed area to the condition of adjoining or similar surfaces in an approved manner. Do not cut any structural member without specific approval. Do not cut any electrical or mechanical lines that may be concealed.
- E. Conceal conduit in chases, furrings, or above ceilings unless indicated otherwise. Flush mount equipment where shown in finished walls where possible.

3.05 FLAME AND SMOKE CONSIDERATIONS:

- A. In ducts or other enclosures used for transporting environmental air, including return air plenums above ceilings, use only products conforming to NFPA and UL composite classifications not exceeding 25 for flame spread and 50 for smoke developed ratings, or install in conduit or approved enclosure. This requirement applies to all materials including signal cable insulation jackets, finishes, and etc.

- B. Completely seal penetrations made through fire and/or smoke rated walls, ceilings, floors, or other barriers for the passage of conduit with a UL listed material to preserve the fire/smoke rating of the barrier.

3.06 COORDINATION:

- A. Coordinate the electrical work with the work of related trades to avoid interference. Determine the exact route of conduit prior to fabrication and the exact location of each outlet and equipment enclosure prior to installation.
- B. Study the Architectural, Structural, Mechanical and Electrical Drawings, and Specifications including Shop Drawings and manufacturer's technical data sheets, and compare to actual site conditions and constraints. In case of conflicts or interference, obtain clarification or instructions before performing any work.
- C. Piping or equipment requiring slope or specific mounting elevations will generally have right of way over conduit and other products whose elevations can be changed.
- D. Carefully plan the sequence of work as required to minimize disruptions and installation time.

3.07 EQUIPMENT CONNECTIONS:

- A. Make all required electrical connections to each item of equipment shown or specified including equipment furnished by Owner, and make operational.

3.08 PROTECTION REQUIREMENTS:

- A. Locate existing utility lines and adequately identify and protect during the execution of the work.
- B. Protect public and private property against damage.
- C. Protect all work including building finishes against damage due to dirt, water, chemicals, frost, heat, handling, theft, and etc. Keep openings in conduit and equipment closed with suitable plugs or caps during installation.
- D. Provide necessary warning devices, barricades, or coverings required for safety around exposed "live" parts or high temperature surfaces.

3.09 CHASES AND OPENINGS:

- A. Provide templates or details for chases and other openings required through floors, walls, ceilings, and etc. to accommodate conduit.
- B. Provide any necessary cutting or drilling for required openings, and patch and refinish as directed.

3.10 PAINTING:

- A. Painting shall be performed in accordance with the painting section of these specifications.
- B. Paint conduit, equipment, and etc. exposed in finished areas to match adjacent surfaces as directed.
- C. Paint conduit flat black, or as directed, if visible through grilles or other openings.

- D. Paint all exposed conduit and equipment on outside of building or in equipment rooms for uniform appearance or identification as directed.
- E. Paint plywood backboards used for mounting equipment prior to installing equipment.
- F. Touch-up scratches in factory finished surfaces with an approved paint to match the surface.

3.11 TESTING AND ADJUSTING:

- A. Test the completed electrical systems and prove free from short circuits, poor connections, and improper grounding.
- B. Maintain on the premises a first class voltmeter, ammeter, milli-ohmmeter, and meggar insulation tester in proper calibration and provide test measurements as required.
 - 1. Meggar all 600 volt rated wiring at 1000 volts minimum before applying power. Prove resistance in excess of 10 megohms.
 - 2. Test metal conduit and grounds for continuity and prove resistance less than one ohm to farthest outlet from system ground.
 - 3. Test system ground to earth per the NEC.
- C. Align, adjust, calibrate, and test all systems to assure safe and proper operation.
- D. Verify proper taps on motors and transformers for rated performance.

3.12 POST CONSTRUCTION SUBMITTALS:

- A. Deliver special tools, and other products necessary for proper operation and maintenance of the electrical systems.
- B. Deliver spare parts as called for under other Electrical Sections contained herein or on the Drawings.
- C. Submit Project Record Documents indicating all changes from the Contract Documents made during construction.
- D. Submit Certificates of Final Inspections from the Administrative Authority.
- E. Submit Operation and Maintenance Manuals covering all phases of equipment and systems provided. Include complete spare parts data with current prices and sources of supply. Include copy of manufacturing data sheets and shop drawings required in pre-construction submittals.
- F. Submit extended warranties in excess of the standard one year warranty where required by other Electrical Sections contained herein or on the Drawings.
- G. Assemble all post construction documents for electrical system in 3-ring binder(s) with divider tabs labeled and properly indexed. Submit the number of sets and arranged as required by Architect.
- H. Submit all closeout documents in accordance with Division 1 of these specifications.

3.13 INSTRUCTIONS TO OWNER:

- A. Provide competent instruction to Owner's personnel covering operation and maintenance of all electrical systems. Provide specialized instruction by manufacturer's technical representatives when required.

3.14 USE OF EQUIPMENT:

- A. The contractor shall not use the permanent electrical system for construction activity except by special permission.
- B. If permitted, the contractor's use of any equipment shall not reduce warranty time specified for the equipment.
- C. If permitted, lamps, ballasts and other such items used during construction shall be replaced by the contractor prior to acceptance if used for more than 5% of their rated life.

3.15 GENERAL WARRANTY:

- A. Warrant the electrical installation against defects in products and/or workmanship for a period of one (1) year from the date of substantial completion in accordance with architect's specifications.
- B. Provide all labor, replacement parts, services, transportation, and incidental costs necessary for the proper operation of all electrical systems during the warranty period.
- C. Make good any damage to the building or grounds or other equipment resulting from defects in products and/or workmanship during the warranty period.

END OF SECTION

MEDIUM VOLTAGE CABLES
SECTION 26 05 13 (16120)

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Power wiring and connectors, 600 volts or less
- B. Control and signal wiring and connectors
- C. Miscellaneous materials

1.02 RELATED WORK:

- A. Section 26 01 00 (16010) Operation and Maintenance of Electrical Systems
- B. Section 26 05 33 (16110) Raceway and Boxes for Electrical Systems
- C. Section 26 05 29 (16190) Hangers and Supports for Electrical Systems
- D. Section 26 05 53 (16195) Identification for Electrical Systems
- E. Section 26 05 26 (16450) Grounding and Bonding for Electrical Systems

1.03 SUBMITTALS:

- A. Submit Manufacturers data sheets for fixture whips and for each type of wiring connector proposed for use.

PART 2 - PRODUCTS

2.01 POWER WIRING AND CONNECTORS:

- A. For service entrance, feeders and branch circuits, use single conductor annealed copper with 600-volt code type THHN insulation for above ground dry locations and dual rated THHN/THWN insulation for wet locations or underground or under slab locations unless noted otherwise.
- B. For lighting fixture whips, it is permissible to use code type MC cable with copper conductors and metal jacket with wire gauge and type complying with the NEC for fixture wire. Maximum length of fixture whips shall be 6 feet and shall include integral green insulated grounding conductor.
- C. Minimum wire size is #12 AWG except for fixture whips. Where developed distance from panelboard to first outlet exceeds the following, increase minimum size to #10 AWG.
 - 1. 65 ft. for 120 volt circuits
 - 2. 115 ft. for 208-240 volt circuits
 - 3. 150 ft. for 277 volt circuits
 - 4. 265 ft. for 480 volt circuits
- D. #12 and #10 AWG wire used for lighting, receptacles, and other non-vibrating equipment may be solid conductor. All other wiring including wiring connecting to motors, transformers, and special grounding systems shall be stranded conductor.
- E. Make splices required in #12 and #10 AWG wire with insulated "Scotchlok" connectors.

- F. Make splices in all wire #8 AWG or larger with approved crimp-on or bolted pressure connectors with snap-on or bolt-on insulated caps.
- G. The voltage and temperature ratings of the connector insulator shall be at least equal to that required of the conductor insulation.
- H. Furnish wire with color coding conforming to the following:

<u>Conductor</u>	<u>250V or Less</u>	<u>480V/277V</u>
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

Color coding may be solid or striped-colored insulation. Colored plastic tape may be used at terminations on #8 AWG and larger conductors with black insulation.

2.02 CONTROL AND SIGNAL WIRING AND CONNECTORS:

- A. Use stranded annealed copper conductors with insulation suitable for the purpose.
- B. For applications, 50 volts and greater, use #14 AWG minimum size conductor with 600 volt insulation and approved for the application.
- C. For power limited wiring and less than 50 volts, use #18 AWG minimum size conductor except for multi-conductor cable recommended or required by the system manufacturer.
- D. For power limited wiring in air plenums, use type CLP, CMP or FPLR if not in conduit for signal, communication, or fire alarm, respectively.
- E. For power limited wiring not in air plenums or installed in conduit and used for fire alarm and detection systems, use type FPL.
- F. Make splices required in #14 through #10 AWG wire with insulated "Scotchlok" connectors.
- G. Make splices required in #16 AWG and smaller wire with insulated crimp-on terminals screw connected to numbered terminal strips, or use approved cable connectors.
- H. Provide RG-6 coax cable with type "F" connectors for TV cable where shown.

2.03 MISCELLANEOUS MATERIALS:

- A. Where required, use wire lubricating compound suitable for the wire insulation and conduit and that does not harden nor become adhesive. Do not use on wiring for isolated power systems.
- B. Use plastic tape that is flame retardant and cold and weather resistant equal to Scotch #33.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Thoroughly clean conduit prior to pulling-in wires. Do not install wire until the raceway can be maintained in a dry condition.

- B. Use non-metallic pulling ropes attached to the conductors by means of woven basket grips or pulling eyes. Pull all conductors for a conduit run in together in such a manner as to avoid damage to the conductors, insulation, or conduit.
- C. Neatly trim and nest multiple conductors and cables in boxes and enclosures and hold in place with "tie-wraps." Where conductors terminate in panelboards, arrange conductors to be perpendicular or parallel to circuit breaker line-up.
- D. Make splices and terminations mechanically and electrically secure. Splices shall only be made in a suitable accessible junction box.
- E. Where multiple paralleled conductor make-ups are indicated on the Drawings for large feeders, the conductors shall be identical in length, gauge, code type, and etc., and shall be terminated exactly alike.

END OF SECTION

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
SECTION 26 05 26

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Equipment grounding and bonding
- B. System grounding
- C. Transformer secondary grounding

1.02 RELATED WORK:

- A. Section 26 01 00 General Electrical Requirements
- B. Section 26 05 33 Boxes and Enclosures

1.03 SUBMITTALS:

- A. Submit certified test report of grounding electrode resistance.

PART 2 - PRODUCTS

2.01 GROUNDING ELECTRODES:

- A. Provide 5/8 inch x 10 feet "copperweld" ground rods and accessories as required to achieve proper system ground.

2.02 GROUNDING WIRES:

- A. Provide insulated grounding conductors and jumpers sized in accordance with the NEC but no smaller than #12 AWG. Identify with continuous green insulation or with green tape at each termination.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Bond the entire metal raceway system including conduit, boxes, enclosures, equipment frames, motor housings, and etc. System to be mechanically and electrically continuous throughout installation.
- B. Bond grounding conductor to conduit at the entrance and exit from that conduit containing only the grounding conductor.
- C. Install grounding jumper from connector bushings to equipment grounding bars. Bond grounding bars and lugs to housing, except where an isolated ground is indicated.
- D. Install separate grounding conductor in all raceway systems.
- E. Bond the grounding wires to each box and enclosure through which they pass, except where an isolated ground is indicated.
- F. Where an isolated grounding (IG) system is indicated, maintain electrical isolation between the grounding conductors and the metal raceway system from the grounding terminals of IG receptacles

back to the system grounding point.

- G. Install grounding electrode in accordance with the NEC. Prior to connecting to system, measure ground resistance under "normal dry weather" conditions. If the electrode to ground resistance is not less than 25 ohms, install additional grounding electrode as required by the NEC.
- H. Establish the system ground (grounding bar) at the service entrance. Bond this bar to all of the following:
 - 1. Metal raceway system.
 - 2. Grounding conductors, including those for isolated grounding systems.
 - 3. The service entrance neutral conductor. Keep neutral conductors isolated from ground throughout electrical system except at the system ground.
 - 4. The grounding electrode.
 - 5. Domestic water service pipe. Provide grounding jumper across water meter connections.
 - 6. The building steel including steel reinforcing in concrete foundations and steel frames as applicable.
 - 7. Interior metal gas piping.
- I. Ground neutrals derived from dry-type transformers to building steel or domestic cold water pipe in accordance with the NEC, and bond to the metal raceway system. Keep neutral conductors isolated from ground throughout the transformer's secondary distribution system except at the derived source.

END OF SECTION

RACEWAYS
SECTION 26 05 31

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Conduit and fittings
- B. Wireways
- C. Sleeves
- D. Seals

1.02 RELATED WORK:

- A. Section 26 01 00 General Electrical Requirements
- B. Section 26 05 32 Wires and Cables
- C. Section 26 05 51 Supporting Devices
- D. Section 26 05 53 Electrical Identification

1.03 SUBMITTALS:

- A. Submit Manufacturer's data sheets on each manufactured assembly such as special fittings, modular seals, fire-stop material, and etc.

1.04 QUALITY ASSURANCE:

- A. Use only materials that are UL listed for the application and that bear the UL label.

PART 2 - PRODUCTS

2.01 CONDUIT AND FITTINGS:

- A. Rigid Metal Conduit (RMC):
 - 1. Heavy wall steel pipe, hot dipped galvanized inside and out, and with ends factory threaded prior to galvanizing (except at terminations).
 - 2. Use only steel or malleable iron fittings.
 - 3. Use box connectors with "biting" type locknuts. Use insulated bushings where wire is larger than #8 AWG. Provide approved watertight hubs in wet locations.
 - 4. Use threaded couplings or approved unions.
 - 5. Use factory elbows, long sweep where possible. Provide watertight "LB" fittings with gasketed covers where required.
- B. Electrical Metallic Tubing (EMT) (the term "conduit" also applies to EMT):
 - 1. Zinc electroplated inside and out, and with threadless ends.
 - 2. Use set screw type fittings where concealed in walls, ceilings, etc., and use watertight and concrete tight gland and ring compression fittings where exposed or in concrete.
 - 3. Use box connectors with "biting" type locknuts. Use insulated bushings where wire is larger than #8 AWG.

- C. Non-metallic Conduit (NMC):
 - 1. Schedule 40 polyvinyl chloride (PVC) electrical conduit with smooth straight ends.
 - 2. Use couplings and connectors of same material as conduit, and joined with solvent-cement specifically manufactured for the purpose.
 - 3. Use only RMC or IMC elbows with PVC-NMC adapters. PVC-NMC elbows are not acceptable unless specifically allowed on the Drawings.
 - 4. Use PVC-NMC box connectors only where allowed, such as for floor boxes.

- D. Liquidtight Flexible Metal Conduit (LFMC):
 - 1. Electroplated steel tubing with extruded PVC jacket equal to "sealtight."
 - 2. Use steel or malleable iron LFMC box connectors with insulated throats and a threaded grounding cone.

- F. Flexible Metal Conduit (FMC):
 - 1. Electroplated steel tubing equal to "Greenfield."
 - 2. Use steel or malleable iron FMC box connectors with insulated throats and of type that threads into conduit convolutions.

- G. Rigid Aluminum Conduit (RAC)
 - 1. Heavy wall aluminum pipe with factory threaded ends.
 - 2. Conduit and fittings shall comply with ANSI C80.5
Use factory elbows, long sweep where possible

2.02 WIREWAYS:

- A. Provide wireways properly sized to accommodate the conductors or as shown on the Drawings.
- B. Provide wireways of code gauge steel with baked enamel finish. Furnish all necessary hardware and accessories.

2.03 SLEEVES:

- A. Provide Schedule 40 galvanized steel pipe sleeves sized to accommodate the outside dimension of conduit.
- B. Provide integral waterstop collar on sleeves in outside walls.

2.04 SEALS:

- A. Where conduit penetrates roof membrane, provide flashing assembly or pitch pan as recommended by roofing manufacturer.
- B. Where conduit penetrates outside walls, make watertight with approved sealant or provide modular rubber seal designed for the purpose.
- C. Use conduit sealing compound equal to "Ductseal" or use approved modular sealing fittings to seal between conductors and conduit where conduit passes from warm to cold spaces, as well as from the outside.

- D. Use 3M "Fire Barrier" or non-shrinking grout to seal between the conduit and sleeve through fire/smoke barriers.

PART 3 - EXECUTION

3.01 CONDUIT APPLICATIONS:

- A. Use RMC for the following applications:
 - 1. Above grade and exposed outdoors
 - 2. Wet locations
 - 3. Risers from under slab or underground, including underground elbows
 - 4. Locations subject to mechanical injury.
- B. Use EMT for above ground, inside, dry locations not subject to mechanical injury.
- C. Use NMC for underground or under slab only.
- D. Use LFMC for the final connection to motors, transformers and other adjustable or vibrating equipment exposed in finished areas or installed in wet or damp locations.
- E. Use FMC for the final connection to adjustable or vibrating equipment in dry, unfinished locations and to lighting fixtures and any other equipment in lay-in ceilings. Maximum length of any runs shall be six (6) feet except by special permission.

3.02 INSTALLATION:

- A. Size raceways for the number, AWG, and type of conductors to be installed therein in accordance with the NEC, but no smaller than $\frac{3}{4}$ " for homeruns and $\frac{1}{2}$ " for branches.
- B. Install conduit in standard 10 foot lengths except where a shorter section is required. Make required field cuts square and ream until all burrs are removed. Field cut threads required for RMC shall be coated with a high zinc dust content galvanizing repair compound with high electrical conductivity.
- C. Make field bends in EMT with an approved bending machine or device, and make free from kinks, dents, or flattened surfaces. Field bends in RMC are not allowed. Do not exceed 90° in any individual bend nor exceed 360° of total bends or elbows in any one conduit run.
- D. Maintain at least 6 inches clearance between conduit and hot piping or equipment.
- E. Where conduit crosses a building expansion joint, provide a junction box on each side of the joint and connect with a slack section of FMC, or provide approved expansion fitting with integral ground jumper.
- F. The diameter of conduit installed in structural slabs shall not exceed 20% of the thickness of the slab, and shall be installed as close to the center plane of the slab as possible.
- G. Provide sleeves for conduit through masonry or concrete walls, foundation walls, or concrete beams prior to laying up or pouring. Make wall sleeves flush with wall.
- H. Provide sleeves for conduit through structural slabs above grade prior to pouring. Make floor sleeves extend one inch above floor and seal watertight. For core drilled penetrations in existing floors, provide one inch angle rings or escutcheons set in sealant in lieu of floor sleeves.
- I. Where outlets serving different rooms are mounted back-to-back or side-by-side in the same wall, sound insulate the boxes from each other with batt insulation. If the boxes are connected to each other through conduit, seal the conduit (after wiring) with "Ductseal."

- J. The Drawings indicate diagrammatically branch circuits and feeders required. Install conduit runs to accommodate the wiring requirements.

3.03 EMPTY CONDUIT SYSTEMS:

- A. Where indicated on the Drawings, provide empty conduit of types as specified herein for future installation of wire or cable.
- B. Leave fish wire or rope in conduit with proper labels attached.

END OF SECTION

WIRES AND CABLES
SECTION 26 05 32

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Power wiring and connectors, 600 volts or less
- B. Control and signal wiring and connectors
- C. Miscellaneous materials

1.02 RELATED WORK:

- A. Section 26 01 00 General Electrical Requirements
- B. Section 26 05 31 RACEWAYS
- C. Section 26 05 51 Supporting Devices
- D. Section 26 05 53 Electrical Identification

1.03 SUBMITTALS:

- A. Submit Manufacturers data sheets for fixture whips and for each type of wiring connector proposed for use.

PART 2 - PRODUCTS

2.01 POWER WIRING AND CONNECTORS:

- A. For service entrance, feeders and branch circuits, use single conductor annealed copper with 600-volt code type THHN insulation for above ground dry locations and dual rated THHN/THWN insulation for wet locations or underground or under slab locations unless noted otherwise.
- B. For lighting fixture whips, it is permissible to use code type MC cable with copper conductors and metal jacket with wire gauge and type complying with the NEC for fixture wire. Maximum length of fixture whips shall be 6 feet and shall include integral green insulated grounding conductor.
- C. Minimum wire size is #12 AWG except for fixture whips. Where developed distance from panelboard to first outlet exceeds the following, increase minimum size to #10 AWG.
 - 1. 65 ft. for 120 volt circuits
 - 2. 115 ft. for 208-240 volt circuits
 - 3. 150 ft. for 277 volt circuits
 - 4. 265 ft. for 480 volt circuits
- D. #12 and #10 AWG wire used for lighting, receptacles, and other non-vibrating equipment may be solid conductor. All other wiring including wiring connecting to motors, transformers, and special grounding systems shall be stranded conductor.
- E. Make splices required in #12 and #10 AWG wire with insulated "Scotchlok" connectors.
- F. Make splices in all wire #8 AWG or larger with approved crimp-on or bolted pressure connectors with snap-on or bolt-on insulated caps.

- G. The voltage and temperature ratings of the connector insulator shall be at least equal to that required of the conductor insulation.
- H. Furnish wire with color coding conforming to the following:

<u>Conductor</u>	<u>250V or Less</u>	<u>480V/277V</u>
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

Color coding may be solid or striped-colored insulation. Colored plastic tape may be used at terminations on #8 AWG and larger conductors with black insulation.

2.02 CONTROL AND SIGNAL WIRING AND CONNECTORS:

- A. Use stranded annealed copper conductors with insulation suitable for the purpose.
- B. For applications, 50 volts and greater, use #14 AWG minimum size conductor with 600 volt insulation and approved for the application.
- C. For power limited wiring and less than 50 volts, use #18 AWG minimum size conductor except for multi-conductor cable recommended or required by the system manufacturer.
- D. For power limited wiring in air plenums, use type CLP, CMP or FPLR if not in conduit for signal, communication, or fire alarm, respectively.
- E. For power limited wiring not in air plenums or installed in conduit and used for fire alarm and detection systems, use type FPL.
- F. Make splices required in #14 through #10 AWG wire with insulated "Scotchlok" connectors.
- G. Make splices required in #16 AWG and smaller wire with insulated crimp-on terminals screw connected to numbered terminal strips, or use approved cable connectors.
- H. Provide RG-6 coax cable with type "F" connectors for TV cable where shown.

2.03 MISCELLANEOUS MATERIALS:

- A. Where required, use wire lubricating compound suitable for the wire insulation and conduit and that does not harden nor become adhesive. Do not use on wiring for isolated power systems.
- B. Use plastic tape that is flame retardant and cold and weather resistant equal to Scotch #33.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Thoroughly clean conduit prior to pulling-in wires. Do not install wire until the raceway can be maintained in a dry condition.
- B. Use non-metallic pulling ropes attached to the conductors by means of woven basket grips or pulling eyes. Pull all conductors for a conduit run in together in such a manner as to avoid damage to the conductors, insulation, or conduit.

- C. Neatly trim and nest multiple conductors and cables in boxes and enclosures and hold in place with "tie-wraps." Where conductors terminate in panelboards, arrange conductors to be perpendicular or parallel to circuit breaker line-up.
- D. Make splices and terminations mechanically and electrically secure. Splices shall only be made in a suitable accessible junction box.
- E. Where multiple paralleled conductor make-ups are indicated on the Drawings for large feeders, the conductors shall be identical in length, gauge, code type, and etc., and shall be terminated exactly alike.

END OF SECTION

BOXES AND ENCLOSURES
SECTION 26 05 33

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Junction and pull boxes
- B. Outlet boxes
- C. Enclosures

1.02 RELATED WORK:

- A. Section 26 01 00 General Electrical Requirements
- B. Section 26 05 32 Wires and Cables
- C. Section 26 05 51 Supporting Devices
- D. Section 26 05 53 Electrical Identification

1.03 SUBMITTALS:

- A. Submit Manufacturer's data sheets on special enclosures.

PART 2 - PRODUCTS

2.01 JUNCTION AND PULL BOXES:

- A. In dry locations, provide boxes of code gauge steel with galvanized or baked enamel finish and with bolted or screw attached covers.
- B. In damp or wet locations, provide cast metal type FS or FD boxes with gasketed covers. For underground locations, provide Quazite composition type boxes with watertight gasketed covers.

2.02 OUTLET BOXES:

- A. In dry locations, provide outlet boxes of code gauge galvanized steel. Install concealed outlet boxes so that work is flush with finished surfaces with no gaps.
- B. In unplastered masonry walls, use 3 1/2" deep solid or sectional type boxes with square corners.
- C. For empty conduit system outlets, provide 4" square boxes with single gang adapter ring unless noted otherwise.
- D. For surface mounted lighting fixtures and equipment, provide 4" octagonal boxes with rings except where smaller boxes are required for fixtures or equipment.
- E. Provide Hubbell PFBRG boxes for floor outlets. Furnish with flush bronze cover with flip lids or concentric plugs as applicable. Provide type of cover compatible with floor finish.
- F. Provide galvanized extension rings, plaster rings, fixture studs, and etc. as required by conditions.
- G. In damp or wet locations, provide cast metal type FS or FD boxes with gasketed covers and

watertight flip lids as required by device.

2.03 ENCLOSURES:

- A. Provide code gauge steel enclosures with baked enamel finish as manufactured by Hoffman to facilitate the installation of multiple components such as small motor starters, contactors, equipment controls, and etc.
- B. Furnish with hinged door and captive fasteners.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Properly size boxes in accordance with the NEC to accommodate the number and size of conductors and conduits entering the boxes.
- B. Size enclosures to adequately accommodate the equipment with space for wiring and maintenance.
- C. Provide junction or pull boxes to facilitate pulling or splicing of conductors so that no one conduit run will exceed the allowable bends of 360°.
- D. Outlet boxes installed in structural slabs shall be of the proper depth to avoid bends in conduit from the center plane of the slab.
- E. All boxes shall be accessible at all times. Provide approved access panels where required to maintain accessibility.
- F. Close any unused knockouts or openings in boxes or enclosures with suitable caps or covers.
- G. Wall switch boxes for room lights and other devices shall be installed within 8 inches of door jamb except by special permission.

END OF SECTION

WIRING DEVICES
SECTION 26 05 34

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Wall switches
- B. Receptacles
- C. Cover plates
- D. Power poles
- E. Lighting controls

1.02 RELATED WORK:

- A. Section 26 01 00 General Electrical Requirements
- B. Section 26 05 32 Wires and Cables
- C. Section 26 05 51 Supporting Devices
- D. Section 26 05 53 Electrical Identification

1.03 SUBMITTALS:

- A. Submit Manufacturer's data sheets on each type of device proposed for use.

PART 2 - PRODUCTS:

2.01 WALL SWITCHES:

- A. Provide single pole, double pole, three way, four way, pilot light, and etc., toggle or key operated as indicated on the Drawings.
- B. Furnish switches of the mechanically silent type rated for 120/277 volts, 20 amperes, with fluorescent or incandescent loads. Use high capacity silver alloy for switch contacts.
- C. The color of switch handles shall be as directed by the Architect.
- D. Furnish switches equal to Hubbell Specification Grade Series HBL122 switches with screw terminals and an approved grounding device.

2.02 RECEPTACLES:

- A. For general use convenience receptacles, use NEMA 5-20R, back and side wire, equal to Hubbell Specification Grade Series HBL 5352 for duplex and HBL 5251 which is a NEMA 5-15R for simplex receptacle.
- B. For ground fault circuit interrupter (GFCI) receptacles, use NEMA 5-20R, back and side wired with test and reset push buttons. Set trip point at 5 ma fault current. Furnish device equal to Hubbell specification Grade Series GF 5362.

- C. Where hospital grade receptacles are indicated, use NEMA 5-20R, with back wired terminals and a steel central support plate across the face. Identify all hospital grade receptacles with a green dot on the face and UL labeled as such. Provide Arrow Hart Series 8300.
- D. Where safety type receptacles are indicated, use NEMA 5-15R, with back wired terminals and a mechanical interlock device to prevent inserting object into only one terminal. Furnish device equal to Arrow Hart TR82.
- E. Where isolated ground receptacles are indicated, use NEMA 5-20R with ground terminal isolated from mounting plate. Identify isolated ground receptacles with an orange triangle on the face and UL labeled as such. Furnish device equal to Hubbell Series IG 5362.
- F. Where clock hanger outlets are indicated, use NEMA 5-15R Specification Grade equal to Hubbell Series HBL 5235.
- G. For special purpose receptacles for appliances or other equipment, provide NEMA type compatible with plug configuration of appliance. Furnish Specification Grade or better.
- H. The color of receptacle face plates shall be as directed by the Architect unless shown otherwise. Furnish emergency power receptacles with red face plates.

2.03 COVER PLATES:

- A. Furnish cover plates equal to Leviton 860 Series plastic of color to match device face unless shown otherwise or Leviton 840 series in 302 stainless steel where indicated. Nylon cover plates will not be allowed.
- B. Gang groups of wall switches and/or receptacles installed in multi-gang boxes under one continuous cover. Wall dimmer switches shall not be ganged unless otherwise indicated on drawings.
- C. For outdoor or other wet location receptacles subject to long term or permanent continuous unattended use, provide weatherproof enclosure, the integrity of which is not compromised when the attachment plug is inserted, per NEC 410-57 (b). Cover shall be equal to Carlon E9U Series.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Adjust switches and receptacles to mount flush and plumb.
- B. Provide cover plates that fit the devices securely and completely cover wall openings. Properly fill and patch oversized wall openings. For outdoor receptacles, provide covers with orientation to match receptacle installation, i.e., vertical covers for vertical receptacles and horizontal covers for horizontal receptacles.
- C. Properly identify red emergency power receptacles with plastic nameplates or directly engraved in the red cover plate. Identify with the letters "EMERGENCY" and the "panelboard and circuit number" supplying them.
- D. For outlets of empty conduit systems such as telephone, television, computer terminals, and etc., provide cover plates compatible with outlet and cable/connector to be installed. Provide blank cover plates on all unused outlets.

END OF SECTION

**SUPPORTING DEVICES
SECTION 26 05 51**

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Anchors
- B. Hangers and supports
- C. Plywood backboards
- D. Concrete bases

1.02 RELATED WORK:

- A. Section 26 01 00 General Electrical Requirements
- B. Section 26 05 32 Wires and Cables
- C. Section 26 05 51 Supporting Devices
- D. Section 26 05 53 Electrical Identification

1.03 SUBMITTALS:

- A. Submit for approval Contractor's shop drawings indicating shape and dimensions of plywood backboards and concrete bases when necessary for clarity and coordination with other trades.

PART 2 - PRODUCTS:

2.01 ANCHORS:

- A. Size anchors for minimum safety factor of two times recommended load. Use only corrosion resistant materials.
- B. In new concrete, use malleable iron inserts set prior to pouring concrete.
- C. In existing concrete or solid masonry, use Phillips "Redhead" expansion shields or Elcen self-drilling expansion shields. Use power driven fasteners only for light loads and with specific approval.
- D. In hollow masonry, use steel toggle bolts.
- E. On structural steel, use approved beam clamps or direct weld.
- F. In wood, use wood screws or lag screws or through-bolt with nuts and washers.
- G. In sheet metal, use self tapping sheet metal screws or machine bolts with washers and nuts.
- H. In bar joists, use threaded hanger rod between bottom angles secured with washers and nuts.

2.02 HANGERS AND SUPPORTS:

- A. For multiple conduit runs, use trapeze hangers consisting of P-1000 "Unistrut" channels with pipe clamps and steel hanger rods where suspended. Anchor "Unistrut" to wall where multiple runs are wall mounted.
- B. Support individual conduits with malleable iron one-hole conduit clamps, steel two-hole pipe straps, or split ring steel conduit clamps. Wire, perforated iron strap, or steel one-hole clamps will not be acceptable.
- C. For free standing boxes and enclosures, provide steel angle frame constructed to prevent any strain on conduits entering box.
- D. Support conduit through floors with steel riser clamps.
- E. Support conduit on flat roofs with 4"x4"x2' redwood blocks with steel straps loosely clamped to conduit, or a pipe supporting assembly approved by the roofing manufacturer.
- F. Support outlet boxes occurring in lay-in ceilings with approved bar hangers clamped to ceiling grid to prevent any weight from bearing on ceiling tile.
- G. Where hospital grade receptacles or multi-gang outlet boxes occur in metal stud walls, provide "caddy bar" hanger spanned between studs with each outlet box securely bolted to bar hanger. Single outlet boxes may be attached to the steel stud with approved spring steel brackets.
- H. Support lighting fixtures and other equipment located in lay-in ceilings with #12 gauge galvanized steel hanger wire attached to all four (4) corners of fixture.
- I. Support conductors in vertical raceways with approved split-wedge type cable supports. Support multiple conductors with approved cable clamps and "tie-wraps."
- J. Where called for on the drawings, provide communications cable supports equal to B-line 4" cable hooks with quick latch retainers.

2.03 PLYWOOD BACKBOARDS:

- A. Use softwood plywood conforming to PS-1 of the American Plywood Association for the intended application. Generally, provide 3/4" thickness for backboards.

2.04 CONCRETE BASES:

- A. Provide concrete bases for floor mounted equipment indicated on the Drawings and all exterior equipment mounted on grade. Use proper cement/sand mix to achieve strength of 3000 psi after 28 days.
- B. Provide steel reinforcing bars as required and provide proper ties and support during pouring.
- C. Provide properly sized anchor bolts held in position with templates. Where anchor bolts cannot be held in sufficient alignment, provide adjustable bolts in pipe sleeves.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install anchors in accordance with manufacturer's recommendations but sized to accommodate at least twice the actual load. Oversized holes that may weaken the installation will not be acceptable.

- B. Support all boxes and equipment enclosures directly by the building structure independently of the conduit.
- C. Support conduit independently by the building structure at intervals complying with the NEC. Do not support conduit from piping, ductwork, or suspended ceiling hangers.
- D. Support conduit without sagging to provide drainage of condensation.
- E. Permanently and securely support conduit, boxes, and enclosures before installing any wiring.
- F. Provide plywood backboards for all equipment mounted to masonry or concrete walls. Provide backboards for any type wall for installation of multiple enclosures or products such as contactors, timers, motor starters, automatic controls, telephone equipment, and etc. Generally, size backboards to accommodate the equipment plus a 3" border on all sides.
- G. Establish sizes of concrete bases required to accommodate equipment. Generally, make bases extend 3" larger than equipment on all sides. Prior to pouring on existing slab, set steel re-bar dowels in holes drilled in existing slab for proper anchorage of base. Install near each corner and at other intervals not to exceed 24 inches. Trowel finish and rub smooth. Form edges with 3/4" chamfer.

END OF SECTION

**ELECTRICAL IDENTIFICATION
SECTION 26 05 53**

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Equipment nameplates
- B. Name tags
- C. Circuit directories
- D. Utility marker tape
- E. Self-adhering labels
- F. Wire markers

1.02 RELATED WORK:

- A. Section 26 01 00 General Electrical Requirements

1.03 SUBMITTALS:

- A. Submit for approval, Manufacturer's data sheets on each manufactured identifying device.
- B. Submit for approval, a schedule of nameplates to be affixed to each item.

1.04 QUALITY ASSURANCE:

- A. Approved manufacturers are Seton and Brady.

PART 2 - PRODUCTS

2.01 NAMEPLATES:

- A. Identify each major component and controller (except light switches) as it is named on the Drawings with engraved nameplates made from laminated plastic sheets equal to Seton Style 2060.
 - 1. Furnish with white letters on black background except for other color coded requirements.
 - 2. Provide appropriate size nameplates with information easily readable. Generally, furnish 3/4" high nameplates with 3/8" letters for major equipment such as switchboards, panelboards, transformers; and 1/2" high nameplates with 1/4" letters for minor equipment such as disconnect switches, contactors, starters, emergency power receptacles and etc.
- B. Identify entry location of each underground utility by providing an engraved brass nameplate equal to Seton Style EBS permanently attached on the outside wall directly above conduit where it enters building.
 - 1. Furnish 1" high nameplate of .025" or greater thickness.
 - 2. Indicate the type of utility such as "electric service entrance" or "telephone service entrance."

2.02 NAMETAGS:

- A. Identify each outlet box of empty conduit system by affixing a write-on vinyl name tag equal to Seton Style PTOB to each end of pull wire installed in each conduit. Indicate purpose of empty outlet box such as "telephone" with location of pull wire termination such as "main terminal board."
- B. Identify conductors terminated in junction box or outlet box intended for future connection. Provide write-on vinyl name tags indicating panelboard and circuit number or location of source.

2.03 CIRCUIT DIRECTORIES:

- A. Fill out circuit directory cards for cardholder slots inside panelboard doors. Provide typewritten directory indicating function and location served for each circuit used.
- B. Identify undesignated spare circuit breakers by writing the word "spare" in soft pencil in the blank for that circuit number. Leave blank the description line for uninstalled circuit breakers (spaces).
- C. Identify circuits feeding battery backup emergency or exit lighting fixtures.

2.04 UTILITY MARKER TAPE:

- A. For all conduit or direct burial cable installed underground and outside of building, provide continuous plastic tape directly above underground services.
- B. Provide orange or red tape with contrasting letters at regular intervals equal to Seton No. 210 Series.
- C. For multiple underground conduit runs, provide two strips of marking tape; one over each outside conduit.

2.05 LABELS:

- A. Identify each junction box and conduit exposed in equipment rooms or accessible above lay-in ceilings or behind access doors with permanent self-adhering orange labels equal to Seton "Opti-Code."
- B. Indicate voltage class such as "120/208 volts" or the type of signal cable installed therein such as "telephone."

2.06 WIRE MARKERS:

- A. Provide permanent self-adhesive wire markers on each conductor in panelboards or other equipment enclosures.
- B. Indicate the circuit number or terminal number to which the wire is connected.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Attach nameplates with approved adhesive on plastic surfaces and factory baked enameled surfaces only. Attach nameplates with proper screws on all other surfaces.
- B. Where shown, identify emergency system receptacles as to panelboard and circuit number supplying them.
- C. Install nameplates identifying utility service entrance 6" above finished grade.

- D. Attach name tags to pull wires or conductors with nylon cord or other approved method.
- E. Install typewritten circuit directories in appropriate card slots.
- F. Install continuous strip of utility marker tape 12" above conduit or direct burial cable it is identifying. Do not backfill to grade until tape installation is approved.
- G. Install identifying labels on conduit where it enters or leaves a wall or floor and at other intervals not to exceed 20 feet.
- H. Install wire markers so that information is easily visible.

END OF SECTION

DISCONNECT SWITCHES
SECTION 26 18 13

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Fused and non-fused disconnect switches

1.02 RELATED WORK:

- A. Section 26 01 00 General Electrical Requirements
- B. Section 26 05 32 Wires and Cables
- C. Section 26 05 51 Supporting Devices
- D. Section 26 05 53 Electrical Identification

1.03 SUBMITTALS:

- A. Submit Manufacturer's data sheets on each type of disconnect switch proposed for use.

PART 2 - PRODUCTS

2.01 DISCONNECT SWITCHES:

- A. For applications requiring 30-1200 amperes rating or for any two or three pole application, provide NEMA type "HD" (heavy duty) horsepower rated disconnects with enclosures suitable for the applications, such as NEMA 3R for outdoor installations.
 - 1. Provide interlock to prevent door operating with switch in "ON" position.
 - 2. Furnish with grounding block.
 - 3. Provide for padlocking switch in "OFF" position.
 - 4. Furnish with terminals UL listed for 75°C wires.
 - 5. Provide Class R, J, or L fuse provisions as applicable for fusible switches. Provide feature to reject Class H fuses.
 - 6. Furnish with factory baked enamel finish.
- B. For fractional horsepower 120 volt motors with integral overload protection, as well as other 120 volt equipment protected at 20 amperes or less, use specification grade single pole switch in outlet box with minimum ratings as follows:
 - 1. Horsepower rated for one horsepower
 - 2. 120/277 AC volts
 - 3. 20 amperes

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Provide disconnect switch for each fixed appliance or motor load indicated on the Drawings or required by the NEC. Install switch in sight of and within 50 feet maximum of equipment it serves.
- B. Install 20 ampere rated switches with center 4 feet above floor.

END OF SECTION

CIRCUIT BREAKER DISTRIBUTION PANELS
SECTION 26 24 13

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Distribution panelboards rated 225 through 1200 amperes.
- B. Circuit breakers and accessories.

1.02 RELATED WORK:

- A. Section 26 01 00 Electrical Requirements
- B. Section 26 05 51 Supporting Devices
- C. Section 26 05 53 Electrical Identification
- D. Section 26 05 26 Grounding

1.03 SUBMITTALS:

- A. Submit Manufacturer's data sheets for each panelboard and each type of circuit breaker proposed for use. Submit schedule of engraved name plates and panelboard circuit directories.

1.04 QUALITY ASSURANCE:

- A. Approved Manufacturer's are Square D, Siemens, G.E and Cutler-Hammer for comparable and competitive product lines as applicable. Additions to existing panelboards shall be made with circuit breakers and accessories from the same manufacturer as the existing panelboard.

PART 2 - PRODUCTS

2.01 PANELBOARDS:

- A. Furnish with distributed phase sequence type bussing with approved plating. Provide circuit breaker connections as scheduled on the Drawings.
- B. Furnish with wiring terminals UL listed for 75°C and for copper wire.
- C. Enclose bus assembly in galvanized steel cabinet of required gauge and gutter sizes.
- D. Provide "dead front" construction of code gauge steel with flush doors, concealed hinges, and flush cylinder tumbler-type locks. Key all panelboard locks in the building alike and also key like any existing panelboards where possible.
- E. Provide fronts of same size as the cabinets.
- F. Provide solid neutral terminal block that is isolated from the cabinet unless used for a service entrance panelboard.
- G. Provide a grounding terminal block that is bonded to the cabinet plus an additional isolated block if used for an isolated grounded panelboard.

- H. Furnish panelboards with either a main circuit breaker (MCB) or main lugs only (MLO) as scheduled on the Drawings.
- I. Provide molded case circuit breakers of quick-make, quick-break, thermal-magnetic type with trip indication and common trip on all multi-pole breakers.
- J. Provide UL listed HACR type circuit breakers for HVAC equipment marked for use with HACR type circuit breakers.
- K. Where shown, provide shunt trip type circuit breakers with coil clearing contacts and auxiliary relays as required.
- L. Rate each panelboard in accordance with UL Standard 67 for the integrated equipment short circuit rating indicated on the panel schedules. Where MLO is provided, each branch breaker shall have the required interrupting capacity (AIC). MCB may be provided with lower rated AIC branch breakers as long as the UL recognized and tested combinations of the series connected interrupting ratings meet the required integrated equipment short circuit rating indicated on the panel schedules.
- M. Panelboards shall be equal to Square D type I-Line with circuit breaker types compatible with mounting arrangement, trip ratings, interrupting capacity, and etc.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Where floor mounted, mount panelboards on concrete housekeeping pad.
- B. Support and identify as specified in "Related Work", Paragraph 1.02 contained herein.

END OF SECTION

**CIRCUIT BREAKER LIGHTING PANELBOARDS, 240 VAC MAX
SECTION 26 24 16**

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Branch circuit panelboards rated 400 amperes or less
- B. Circuit breakers and accessories

1.02 RELATED WORK:

- A. Section 26 01 00 General Electrical Requirements
- B. Section 26 05 32 Wires and Cables
- C. Section 26 05 51 Supporting Devices
- D. Section 26 05 53 Electrical Identification

1.03 SUBMITTALS:

- A. Submit Manufacturer's data sheets for each panelboard and each type of circuit breaker proposed for use. Submit schedule of engraved name plates and panelboard circuit directories.

1.04 QUALITY ASSURANCE:

- A. Approved Manufacturer's are Square D, Siemens, GE, and Cutler-Hammer for comparable and competitive product lines as applicable. Additions to existing panelboards shall be made with circuit breakers and accessories from the same manufacturer as the existing panelboard.

PART 2 - PRODUCTS

2.01 PANELBOARDS:

- A. Furnish with distributed phase sequence type bussing with approved plating. Provide plug-on or bolt-on circuit breaker connections as scheduled on the Drawings.
- B. Furnish with wiring terminals UL listed for 75°C and for copper wire.
- C. Enclose bus assembly in galvanized steel cabinet of required gauge and gutter sizes.
- D. Provide "dead front" construction of code gauge steel with flush doors, concealed hinges, and flush cylinder tumbler-type locks. Key all panelboard locks in the building alike and also key like any existing panelboards where possible.
- E. For surface mounted cabinets, provide fronts of same size as the cabinets. For recessed cabinets, provide oversized fronts to completely cover wall openings.
- F. Provide solid neutral terminal block that is isolated from the cabinet. Provide an additional grounding terminal block that is isolated from the cabinet when used for service panelboard.

- G. Provide a grounding terminal block that is bonded to the cabinet unless used for an isolated grounded panelboard.
- H. Furnish panelboards with either a main circuit breaker (MCB) or main lugs only (MLO) as scheduled on the Drawings.
- I. Provide molded case circuit breakers of quick-make, quick-break, thermal-magnetic type with trip indication and common trip on all multi-pole breakers. Handle ties on multi-pole breakers will not be accepted. Where required, provide the following special breakers:
 - 1. UL labeled "SWD" (switching duty) on breakers used for switching.
 - 2. UL Class A ground fault circuit interrupter (GFCI) types where ground fault protection is required.
 - 3. Current limiting types with test button and interrupting rating of 200,000 amperes RMS symmetrical for use as main breaker for series connected rating applications.
 - 4. UL listed HACR on breakers serving HVAC equipment marked for use with HACR type circuit breakers.
 - 5. Shunt trip type with coil clearing contacts and auxiliary relays as required.
- J. Rate each panelboard in accordance with UL Standard 67 for the integrated equipment short circuit rating indicated on the panel schedules. Where a Standard MB or MLO is provided, each branch breaker shall have the required interrupting capacity (AIC). At the Contractor's option, a current limiting type main breaker may be provided with lower rated AIC branch breakers as long as the UL recognized combinations of the series connected interrupting ratings meet the required integrated equipment short circuit rating indicated on the panel schedules.
- K. Panelboards shall be equal to Square D type NQOD with circuit breaker types being Q0, Q1, Q2, Q4, IF, IK, or II as applicable.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Mount panelboards with the top 6 feet above finished floor.
- B. Support and identify as specified in "Related Work", Paragraph 1.02 contained herein.

END OF SECTION

LIGHTING
SECTION 26 50 00

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Work under this section includes furnishing and installing the following:
 - 1. Interior and exterior lighting fixtures with lamps, ballasts, accessories and mounting hardware.
 - 2. Exit signs and emergency lighting units with lamps, battery including automatic charger, controls, accessories and mounting hardware.
 - 3. Exterior fixture poles including mast arms, brackets, anchor bolts, concrete bases, accessories and mounting hardware.
- B. The term "fixture" in this section shall pertain to lighting fixtures or luminaires.

1.02 RELATED WORK:

- A. Section 26 01 00 (16010) Operation and Maintenance of Electrical Systems
- B. Section 26 05 13 (16120) Medium Voltage Cables
- C. Section 26 06 20.26 (16140) Wiring Device Schedule
- D. Section 26 05 29 (16190) Hangers and Supports for Electrical Systems

1.03 SUBMITTALS:

- A. Submit manufacturer's product data sheets on each fixture scheduled, arranged in order of fixture designation complete with the following:
 - 1. Description of fixture including dimensions, materials, finishes and verification of indicated parameters. State total connected fixture watts and power factor.
 - 2. Ballast manufacturer and model including electrical and energy efficiency data.
 - 3. Lamp manufacturer and model number with ANSI code including rated watts, lumens, lamp life and color temperature.
 - 4. Photometric data of fixture assembly with lamp/ballast combination as specified.
- B. Submit schedule of extra materials as required in paragraph 1.06 below including quantities of each type to be furnished to the owner upon substantial completion.

1.04 QUALITY ASSURANCE:

- A. All fixtures shall be listed and labeled as defined in article 100 of the NEC by a testing agency acceptable to the authorities having jurisdiction and marked for its intended use. Fixtures installed in damp or wet locations shall be listed and labeled as such.
- B. The manufacturer shall have a qualified responsive service organization with a proven record of successful in-service performance and contractor support during installation and warranty period.

1.05 SPECIAL WARRANTY

- A. Submit a warranty, mutually executed by manufacturer and installer agreeing to replace defective materials or workmanship within five (5) years from date of substantial completion for the items

specified below. This warranty is in addition to, and not a limitation of other rights and remedies the owner may have under the Contract Documents.

1. Electronic ballasts
 2. Rechargeable batteries
 3. Metal parts exhibiting corrosion
 4. Metal or plastic parts exhibiting color fading, staining, cracking or peeling.
- B. Replace any and all lamps, ballasts and fuses that fail within twelve (12) months from date of substantial completion. This is in addition to the stock of "Extra Materials" described below.

1.06 EXTRA MATERIALS

- A. Furnish and deliver to the Owner extra materials matching the installed products as described below, packaged for storage and properly labeled describing contents. Furnish at least one of each type and rating.
1. Lamps: 5 for each 100 of each type and rating installed.
 2. Ballasts: 1 for each 100 of each type and rating installed.
 3. Glass or plastic lenses and covers: 1 for each 100 of each type and rating installed.

PART 2 - PRODUCTS

2.01 FIXTURES AND COMPONENTS:

- A. Comply with the following UL Standards as applicable:
1. UL 1570, Fluorescent Lighting Fixtures
 2. UL 1572, High Intensity Discharge Lighting Fixtures
 3. UL 1571, Incandescent Lighting Fixtures
 4. UL 1574, Track Lighting Systems
- B. Fixtures shall be furnished with all mounting and suspension accessories, brackets, covers and hardware for a complete operating installation in the intended location and mounting configuration.
- C. Metal parts shall be corrosion resistant and shall be rigidly formed and supported to prevent warping and sagging.
- D. Doors, frames and other access trim shall be smooth operating, free of light leaks and capable of relamping without tools.
1. Provide spring loaded latches for fluorescent troffer doors.
 2. Design to prevent doors, frames, diffusers and other components from falling accidentally during relamping or under operating conditions.
 3. Use resilient non-hardening gaskets to seal damp or wet location fixture doors or to prevent light leaks.
- E. Sheet metal surfaces required to be painted shall be painted after fabrication using non-yellowing, non-fading paint. Reflecting surfaces shall have minimum reflectance values as follows:
1. White surfaces: 90 percent
 2. Specular surfaces: 95 percent
 3. Diffusing specular surfaces: 85 percent

- F. Lenses, diffusers, covers and globes shall be 100 percent virgin acrylic plastic or annealed crystal glass.
 - 1. Plastic diffusers shall be highly resistant to yellowing or other changes due to aging, exposure to heat and ultra-violet radiation.
 - 2. Nominal lens thickness for fluorescent troffers shall be .125" minimum.
- G. Indirect fixtures shall be designed for uniform brightness on the ceiling and free from "hot spots" when installed in accordance with manufacturer's recommendations. Optical efficiency of indirect fixtures shall be 85 percent or greater.
- H. Wiring and connectors within the fixture shall have insulation suitable for the voltage, current and temperature to which it will be subjected. Lamp sockets shall comply with UL 542.

2.02 FLUORESCENT LAMP BALLASTS:

- A. General requirements shall include the following:
 - 1. Comply with UL 935, Fluorescent Lamp Ballasts.
 - 2. Contain no PCB's.
 - 3. Designed for the type and quantity of lamps required at full light output.
 - 4. Harmonic distortion of 20% or less.
 - 5. Current crest factor of less than 1.7.
 - 6. Ballast factor of .85-.92 range for normal light output unless scheduled for low watts or high light output on the drawings.
 - 7. Power factor of greater than 96% at full output.
 - 8. Sound rating of "A".
 - 9. Transient voltage protection complying with IEEE C62.41 Category A and electromagnetic interference complying with 47 CFR, Chapter 1, Part 18 for electronic ballasts.
 - 10. Operating frequency of 20 kHz or higher for electronic ballasts.
 - 11. Lamp end-of-life detection and shutdown circuit for electronic ballasts serving compact fluorescent lamps or T5 diameter lamps.
 - 12. Universal voltage taps to field adapt to the available circuit voltage.
- B. For linear lamps manually switched or infrequently switched, use electronic ballasts with the following features:
 - 1. Instant Start type.
 - 2. Parallel lamp circuit in multiple-lamp ballast applications designed to maintain full light output on surviving lamps if one or more lamps fail.
 - 3. Equal to Advance Standard Electronic
- C. For linear lamps controlled by occupancy sensors, use electronic ballasts with the following features:
 - 1. Programmed Rapid Start type.
 - 2. Series lamp connection.
 - 3. Equal to Advance Mark V.
- D. For compact fluorescent lamps (CFL), use electronic ballasts with the following features:
 - 1. Programmed Start type.
 - 2. Flicker free operation.
 - 3. Automatic input voltage sense/selection.
 - 4. Equal to Advance Smartmate or lamp/ballast combination from lamp manufacturer..
- E. For dimmer controlled lamps, use electronic dimming ballasts with the following features:

1. Programmed Start type.
 2. Dimming range from 100 to 10 percent of rated lamp lumens.
 3. Input watts capable of being reduced to less than 20 percent of full power at minimum lumen output.
 4. Certified by ballast manufacturer to be compatible with specific dimming system installed.
 5. Equal to Advance Mark VII.
- F. For emergency lamps, use battery back-up powered fluorescent ballasts with the following features:
1. Comply with UL 924, Emergency Lighting and Power Equipment.
 2. One or two lamp operation to provide minimum of 1000 lumens for linear lamps and 500 lumens for CFL's.
 3. High temperature nickel-cadmium battery with charger and electronic control circuiting for 90 minutes of standby operation.
 4. Test switch and indicator light.
 5. Equal to Bodine B50 or B84 as applicable.
- G. For low temperature environments (less than 50°F), ballasts shall be rated for - 20° F for linear lamps and 0° F for compact fluorescent lamps.

2.03 HIGH INTENSITY DISCHARGE (H.I.D.) LAMP BALLASTS:

- A. General requirements shall include the following:
1. Comply with UL 1029, High Intensity Discharge Lamp Ballasts.
 2. Magnetic constant wattage autotransformer (CWA) type or regulator, high power factor type unless scheduled otherwise on the drawings. If pulse start type is scheduled, it shall specifically match the lamp supplied.
 3. Contain no PCB's.
 4. Open circuit operation will not reduce average life.
 5. Reliable operation in temperature environments from -20° F to 130° F.
 6. Power factor of greater than 90 percent.
 7. Universal voltage taps to field adapt to the available voltage.
 8. Sound rating "A" for interior fixtures and "A or B" for exterior fixtures.
- B. Auxiliary, instant-on quartz system, where scheduled on the drawings, shall have the following features:
1. Automatically switch quartz lamp on when fixture is initially energized and after momentary power outages occur.
 2. Automatically turn off quartz lamp when lamp reaches approximately 60 percent full light output.
 3. Power for quartz lamp shall be supplied from ballast assembly regardless of ballast rated input voltage so that separate auxiliary power circuit is not required.
- C. Instant restrike device, where scheduled on the drawings, shall maintain ignitor with a self-contained rechargeable battery as specified above for instant restarting after power outage.

2.04 LAMPS:

- A. General requirements include the following:
1. Comply with ANSI Standard C78 series applicable to each type of lamp.
 2. Comply with Energy Policy Act including current revisions.
 3. Lamps of specified type shall be the product of a single manufacturer.

4. Linear lamps and CFL's used in same area shall have similar color temperature unless scheduled otherwise on the drawings.
- B. Linear fluorescent lamps shall have the following features unless scheduled otherwise on the drawings:
1. 4 ft. nominal length F32T8. 2, 3 and 8 ft. lengths of T8 diameter as scheduled with approximately 8 watts per lineal foot.
 2. Initial lamp lumens per watt of greater than 92 with end-of-life lumen maintenance of greater than 90%.
 3. Color temperature of 4100° K and color rendering index (CRI) greater than 80.
 4. Rated lamp life with 3 hour start cycle of 20,000 hours minimum.
- C. Compact fluorescent lamps shall have the following features unless scheduled otherwise on the drawings:
1. Initial lamp lumens per watt of greater than 60 with end-of-life lumen maintenance of greater than 85%.
 2. Color temperature of 4100° K and CRI of greater than 80.
 3. Rated lamp life with 3 hour start cycle of 10,000 hours.
- D. High Intensity Discharge lamps (metal halide) shall have the following features unless scheduled otherwise on the drawings:
1. No visible color shift after 100 hours of operation.
 2. Initial lamp lumens per watt of greater than 80 with end-of-life lumen maintenance of greater than 70%.
 3. Color temperature of 3000° K or 4000° K as scheduled and CRI of greater than 65.
 4. Rated lamp life with 10 hour start cycle of 10,000 hours.
 5. Pulse start type lamps, where scheduled on the drawings, shall specifically match their respective ballast.
- E. Incandescent lamps shall have features and requirements as scheduled on the drawings.

2.05 EXIT SIGNS:

- A. Furnish with the following features:
1. Comply with NFPA 101, Life Safety Code.
 2. Comply with local requirements on sign color and letter size.
 3. Directional arrows as required by conditions.
 4. Internally lighted signs shall use light emitting diodes (LED) lamps with 70,000 hours minimum rated lamp life.
- B. Emergency power units shall have the following features:
1. Comply with UL 924, Emergency Lighting and Power Equipment.
 2. Sealed maintenance-free nickel cadmium battery for minimum of 90 minutes of emergency operation without utility power.
 3. Integral automatic two-rate battery charger.
 4. Sealed transfer relay, test switch, indicator light and electronic controls to switch to battery supply when supply voltage drops to below 80% of nominal.

2.06 EMERGENCY LIGHTING UNITS:

- A. Self contained emergency lighting units shall have the following features:

1. Comply with UL 924, Emergency Lighting and Power Equipment.
2. Sealed maintenance-free battery with 10 year nominal life and 5 year warranty. Size for minimum of 90 minutes operation.
3. Automatic two-rate battery charger with sealed transfer relay.
4. Test switch, indicator lights and electronic controls to turn on lamp(s) when supply voltage drops to below 80% of nominal. Turn off lamp(s) when battery voltage approaches deep discharge level.

2.07 POLES:

A. General requirements are as follows:

1. Comply with AASHTO LTS-1, Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals.
2. Steel poles, when scheduled, shall comply with ASTM A500, Grade B, carbon steel with minimum yield of 46,000 psi.
3. Aluminum poles, where scheduled, shall comply with ASTM B 429, Standard Specifications of Aluminum-Alloy Extruded Structural Pipe and Tube. Use 6063-T6 alloy for poles 16' or less. Use 5052-H34 alloy conforming to ASTM 13209 for poles over 16'.
4. Design for wind load strength of 80 mph and 1.3 gust factor for total support assembly including pole, base, anchors, fixtures and appurtenances at the indicated heights above grade without undue deflection or whipping.
5. Provide internal wireway and underground cable entry.
6. Provide access hand hole near pole base.
7. Provide threaded grounding lug or bus bar accessible through hand hole.
8. Arm, brackets and tenon mount materials shall match the poles.
9. Provide factory applied finish as scheduled with color selected by Architect.

B. Provide concrete foundations to support entire pole/fixture assembly under design wind load.

1. Use 3000 psi, 28-day concrete mixture complying with Division 3 Section "Cast-in-Place Concrete" of these specifications.
2. Comply with details and manufacturer's recommendations for steel reinforcing, anchor bolts, hardware and grout.
3. Provide smooth finish with chamfered edges on exposed part of foundations.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. The Contractor shall study the finished conditions.

1. Furnish fixtures compatible with the type of ceiling or wall in which they are to be installed including all required mounting accessories.
2. Relocate any fixture which, after installation, is found to interfere with other equipment or is otherwise located to conflict with proper performance or maintenance as intended.
3. Inspect each installed fixture for damage. Replace damaged fixtures and components.
4. Install lamps in each fixture. Verify normal operation in all modes.

B. Support and connect fixtures per manufacturer's recommendations.

1. Final wiring connections to fixtures located in lay-in ceilings shall be through Flexible Metal Conduit (FMC) or MC cable whips.
2. Lay-in fluorescent fixtures shall be supported at all four (4) corners directly from the structure above with #12 AWG galvanized steel hanger wire. Hanger wires may be attached to the

- fixture or to the ceiling T-bar grid system at the fixture corners. Where hanger wires are attached to the T-bar grid, provide approved earthquake clips to attach fixture to the grid.
3. Recessed fixtures installed in lay-in ceiling panels shall be provided with bar hangers attached to the T-bar grid and supported with a minimum of two #12 AWG galvanized steel hanger wires and shall support fixture with no force on the ceiling panels.
 4. Trim rings shall completely cover openings in ceilings.
 5. Exposed sides of surface mounted fixtures shall have no visible knock-out indentations.
 6. Support suspended fixtures with stem hangers, rods or aircraft cable per manufacturer's details. Where pendants are longer than 48", brace to limit sway.

3.02 CLEANING AND ADJUSTING:

- A. Upon completion of the work, thoroughly clean and polish all fixtures inside and out, and clean all lamps. Use methods and materials recommended by the manufacturer. Adjustable fixtures shall be carefully aimed and positioned in the presence of the Architect.

END OF SECTION

